

aN Eu Curriculum  
for chef gasTro-engineering  
in primARy food caRe



## EU Chef Gastro Engineering Occupational Profile

<b>Deliverable Number:</b>	<b>2.2</b>
<b>WP related to the Deliverable:</b>	<b>02</b>
<b>Actual Date of Delivery to the CEC:</b>	
<b>PARTNER responsible for the Deliverable:</b>	<b>Odisee</b>
<b>WP starting month</b>	<b>November 2020</b>
<b>WP ending month</b>	<b>April 2021</b>



Co-funded by the  
Erasmus+ Programme  
of the European Union

Contents of this document are entirely produced by NECTAR project,  
therefore EACEA and European Commission have no responsibilities on  
them.

AGREEMENT NUMBER – 621707-EPP-1-2020-1-BE-EPPKA2-SSA

## 1 ABSTRACT:

**Background:** According to the World Health Organization (WHO), malnutrition has a high prevalence with increasing numbers in older populations. Within a model from the A3 Action Group of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA), food supply for older people is based upon interprofessional needs assessments and adapted according to primary, secondary and tertiary food care levels which is a major strategy aim in tackling malnutrition. Due to skills gaps of chefs working in health care this model is not implemented uniformly across Europe. These skills gaps exist because of lack of access to education and trainings for chefs in healthcare, lack of curricula which relate to a formalized European Union occupational profile and too little guidance, funding and time invested in the integrated culinary/clinical approach from policy makers, institutional stakeholders and representatives. NECTAR aims to tackle these three problems and describes the Occupational Profile for the Chef Gastro-Engineering (CGE) in this report.

**Method:** Current different profiles for cooks and chefs included in ESCO were summarised, analysed and compared, ensuring that the OP was linked to ESCO. Additional information about already existing qualifications and certifications were collected referring both the NQFs (National Qualification Frameworks) and to EQF (European Qualification Framework). Results of D2.2.1 Report on cooks' skills and needs in the PFC and pre-existing training initiatives and curricula were studied and taken as a baseline of the OP. Best practices that resulted from D2.1.1 Report on existing training initiatives and curricula for cooks in the PFC were analysed in different countries. After, three workshops were held with the partners. After these steps, a working document was created in which all feedback was integrated, and partners could comment on the OP together. After the integration of the feedback, all partners were invited to a 2-hour workshop to discuss all key activities and competences one by one. After integrating the feedback again, five chefs and head of Training of Dieticians were also consulted.

**Results:** Key Activities are divided into 8 activities and 27 competences: 1) Manage suppliers and buy in sustainable food ingredients (linked to 4 competences), 2) Screen, assess and monitor on client-level (linked to 5 competences), 3) Create recipes for a general population and for people with specific needs, complying with recommendations of health professionals (linked to 5 competences), 4) Manage the kitchen and coordinate personnel (linked to 4 competences), 5) Ensure quality of food and follow safety regulations (linked to 3 competences), 6) Use and adapt cooking techniques to the specific care setting and client (linked to 4 competences) and 7) Communicate, interact and collaborate with clients and interprofessional team (linked to 3 competences).

**Conclusion:** The CGE is a completely new profession in healthcare that aims to produce tasty and healthy meals for those with high care needs. Working in an interdisciplinary team, the CGE contributes to improved quality of life of clients. The new Occupational Profile provides the definition, key activities and core competences that are needed for this chef on a daily basis, and serves as a basis for developing the curriculum.

## 2 KEYWORDS:

Chef gastro-engineering, healthcare, curricula, chefs, primary food care, competences

### 3 REVIEWERS

REVIEWER NAME	EXTERNAL REVIEWER	ORGANIZATION	DATE OF APPROVAL
Lobke Van den Wijngaert	Yes	Primary Food Care	18/06/2021
Martijn van Gemst	Yes	Zorgwaard	18/06/2021
Karin Hackensoellner-ali	Yes	Austrian Labour Market Service	18/06/2021
Karin Schindler	Yes	Gesundheitsministerium	18/06/2021
Consuelo Borgarelli	Yes	University of Genoa	18/06/2021
Herman Vandevijvere	Yes	Karel de Grote Hogeschool	29/06/2021

### 4 VERSION HISTORY AND AUTHORS

Version	Name / Organization	Status*	Date	Provided Content/Comment/ Summary of Changes
1	Marjolein Winters	A, C	24.02.2021	Draft Version 1
1	Valentina Wagner	IF	01.03.2021	Feedback on draft version 1
2	Edwig Goossens	IF	03.03.2021	Workshop to discuss the profile
2	Bart Geurden	IF	03.03.2021	Workshop to discuss the profile
2	Martijn van Gemst	IF	03.03.2021	Workshop to discuss the profile
2	Geertrui Vlaemyck	IF	03.03.2021	Workshop to discuss the profile
2	Lobke Van den Wijngaert	IF	03.03.2021	Workshop to discuss the profile
2	Marjolein Winters	C	12.03.2021	Rewrite after partners' first feedback
2	Heidemarie Muller-Riedlhuber	C	16.03.2021	Linking the OP to ESCO
2	Seema Akbar	IF	23.03.2021	Feedback on draft version 2
2	Lucia Schifano	IF	23.03.2021	Workshop to discuss the profile
2	Francesca Vavassori	IF	23.03.2021	Workshop to discuss the profile
2	Valentina Wagner	IF	23.03.2021	Workshop to discuss the profile
2	Valentina Compiani	IF	23.03.2021	Workshop to discuss the profile
2	Heidemarie Müller-Riedlhuber	IF	23.03.2021	Workshop to discuss the profile
2	Seema Akbar	IF	24.03.2021	Workshop to discuss the profile
2	Serena Alvino	IF	24.03.2021	Workshop to discuss the profile
2	Yuri Piccione	IF	24.03.2021	Workshop to discuss the profile

2	Matilde Boriello	IF	24.03.2021	Workshop to discuss the profile
2	Olga Pedemonte	IF	24.03.2021	Workshop to discuss the profile
2	Gallus Lorenzo	IF	24.03.2021	Workshop to discuss the profile
2	Ana Isabel Silva	IF	24.03.2021	Workshop to discuss the profile
2	Gerardo De Paola	IF	24.03.2021	Workshop to discuss the profile
3	Marjolein Winters	C	25.03.2021	Integrating feedback after 3 initial workshops
3	Sandra Pais	IF	26.03.2021	Feedback on profile
3	Regina Roller-Wirnsberger	IF	06.04.2021	Feedback on draft version 3
3	Serena Alvino	IF	08.04.2021	Feedback on draft version 3
3	Valentina Compiani	IF	08.04.2021	National Qualification Framework Italy and feedback on Profile
3	Gerardo de Paola	IF	14.04.2021	Feedback on draft version 3
4	Yuri Piccione	IF	15.04.2021	Final workshop on profile
4	Heidemarie Müller-Riedlhuber	IF	15.04.2021	Final workshop on profile
4	Olga Pedemonte	IF	15.04.2021	Final workshop on profile
4	Francesca Vavassori	IF	15.04.2021	Final workshop on profile
4	Serena Alvino	IF	15.04.2021	Final workshop on profile
4	Geertrui Vlaemynck	IF	15.04.2021	Final workshop on profile
4	Lucia Schifano	IF	15.04.2021	Final workshop on profile
4	Maria Pia Ponticelli	IF	15.04.2021	Final workshop on profile
4	Seema Akbar	IF	15.04.2021	Final workshop on profile
4	Gerardo De Paola	IF	15.04.2021	Final workshop on profile
4	Lobke Van den Wijngaert	IF	15.04.2021	Final workshop on profile
4	Valentina Compiani	IF	15.04.2021	Final workshop on profile
4	Valentina Wagner	IF	15.04.2021	Final workshop on profile
4	Marjolein Winters	C	16.04.2021	Integrating feedback after extra workshop
4	Martine Willems	IF	17.04.2021	Feedback on draft version 4
4	Regina Roller-Wirnsberger	IF	23.04.2021	Feedback on draft version 4
4	Valentina Wagner	IF	23.04.2021	Feedback on draft version 4
4	Edwig Goossens	IF	30.04.2021	Feedback on draft version 4
4	Geertrui Vlaemynck	IF	05.04.2021	Feedback on draft version 4
5	Marjolein Winters	C	07.05.2021	Integrating final feedback and Deliverable

\*Status indicates if:

- A - Author (including author of revised deliverable)
- C - Contributor
- IF – Internal Feedback (within the partner organization)

## 5 TABLE OF CONTENTS

1	ABSTRACT:.....	2
2	KEYWORDS:.....	2
3	INTERNAL REVIEWERS .....	3
4	VERSION HISTORY AND AUTHORS.....	3
5	TABLE OF CONTENTS .....	5
6	LIST OF ABBREVIATIONS .....	6
7	INTRODUCTION .....	7
8	Methodology .....	8
8.1	Process.....	8
8.2	Definitions in the OP .....	8
9	Results – The Profile .....	9
9.1	The Proposal .....	9
9.2	Analysis of different OP in ESCO .....	10
9.3	Analysis of EU Skills Panorama .....	16
9.4	Additional information about existing qualifications and certifications .....	16
9.4.1	Europe .....	16
9.4.2	Belgium.....	17
9.4.3	Austria .....	17
9.4.4	Portugal .....	18
9.4.5	Italy .....	18
9.5	Best practices.....	18
9.6	Results of the Workshops .....	22
9.7	Linking the CGE OP to ESCO .....	25
10	The final Occupational Profile of the CGE .....	27
11	Literature .....	29

## 6 LIST OF ABBREVIATIONS

BFI	Austrian Vocational Promotion Institute
CHAFEA	Consumers, Health, Agriculture and Food Executive Agency
CGE	Chef Gastro-Engineering
CINAHL	Cumulative Index to Nursing & Allied Health Literature
CORDIS	Community Research and Development Information Service
DG	Directorate-General for Health and Food Safety
DGE	German Society of Nutrition
EIPonAHA	European Innovation Partnership on Active and Healthy Ageing
EQAVET	European Quality Assurance in Vocational Education and Training
EQF	European Qualification Framework
ESCO	European Skills/Competences, qualifications and Occupations
EU	European Union
IHK	German Chamber of Industry and Commerce
ILVO	Instituut voor Landbouw-, Visserij- en Voedingsonderzoek
ISCO	International Standard Classification of Occupations
ISCED	International Standard Classification of Education
MUG	Medical University of Graz
NECTAR	aN Eu Curriculum for chef gasTro-engineering in primAry food caRe
OP	Occupational Profile
PFC	Primary Food Care
RRW	Univ.-Prof. Dr.med.univ. Regina Roller-Wirnsberger
RSCN	Reference Site Collaborative Network
VET	Vocational Education and Training
WHO	World Health Organization
WIAB	Wiener Institut für Arbeitsmarkt- und Bildungsforschung (Viennese Institute for Labour Market and Education Research)
WIFI	Austrian Institute for Economic Promotion of the Austrian Economic Chambers

## 7 INTRODUCTION

According to the World Health Organization (WHO) malnutrition has a high prevalence with increasing numbers in older populations. Consequences such as medical and social impact for people affected as well as tremendous economic costs put health care systems under pressure to tackle malnutrition as well in older and multimorbid populations as in those with a high care need. One major strategy aims at improving quality of food supply and food safety for citizens and deliver personalised food care (1). This personalized care approach is based upon the collaboration between different professions gathered around older people and people with a high care need in an interdisciplinary team. Teamwork for optimal nutritional care is based on shared knowledge and attitudes of team members, such as doctors, nurses, dieticians and chefs, according to their individual professional profiles and an open communication among team members and, equally important, their clients (2-5).

Previous work of partners in the A3 Action Group of the European Innovation Partnership on Active and Healthy Ageing (EIPonAHA) delivered an integrated culinary/food and nutrition approach (6) including the elements described for interdisciplinary food supply as such. Within this EIPonAHA model food supply for older people is based upon interprofessional needs assessments and adapted according to primary, secondary and tertiary food care levels. Primary and secondary food care for older people as well as others with a high care need includes intrinsic involvement of specialized chefs in interdisciplinary health and social care teams (6). This model however, is not implemented uniformly across Europe due to still existing skills gaps, especially for chefs. One reason for this current situation is the fact, that many cooks do not have access to tailored educational programmes covering knowledge skills and attitudes mandatory to work in an interprofessional team in health care. Secondly, while there are existing curricula which address these professional profiles for chefs, they don't relate to a formalized European Union (EU) occupational profile based on WHO and EU politics recommendations (7). Third, too little guidance funding and time is invested in the integrated culinary/clinical approach from policy makers, institutional stakeholders and representatives (8). Therefore, the EU-funded project “an EU Curriculum for Chef Gastro-Engineering in Primary Food Care<sup>1</sup> (NECTAR)” aims to address all three domains, skills gaps of cooks who work in health and social care, are addressed.

According to ESCO (9), an occupation is a grouping of jobs involving similar tasks which require a similar skills set. Occupations should not be confused with jobs or job titles. While a job is bound to a specific work context and executed by one person, occupations group jobs by common characteristics. As a first step in the NECTAR project, an OP for CGE is defined, as the EU benchmark for VET of chefs in PFC. Existing research evidence on chefs' skills needs are integrated, in order to make the OP as adherent as possible for current (and future) working and occupational context for CGE. Therefore, this report addresses the OP of the CGE by identifying and describing its key activities, defined as an integrated group of professional competences, which are in their entirety necessary to perform a task relevant to the job profile. This report covers all activities for the performance of the profession, regardless of its application context.

---

<sup>1</sup> Primary food care (PFC) is all the care that is spent on the balanced composition, appropriate preparation and daily providing of regular meals. Optimal PFC is the result of integrated care in which many stakeholders are involved, including the persons themselves and their family caregivers. PFC was first described by EIP/AHA as an indispensable part of the food-and-nutritional approach to nutritional frailty in elderly.

## 8 Methodology

### 8.1 Process

To define an EU reference OP for CGE which could provide the baseline for the EU Curriculum and for the definition of the CGE qualification, the NECTAR consortium performances were plural and considered in a three-step approach:

1. As a preliminary activity to the definition of the CGE OP, current different profiles for cooks and chefs included in ESCO were summarised, analysed and compared. After this analysis, the EU Skills Panorama was also analysed. Additional information about already existing qualifications and certifications were collected referring both the NQFs (National Qualification Frameworks) and to EQF (European Qualification Framework). Results of D2.2.1 Report on cooks' skills and needs in the PFC and pre-existing training initiatives and curricula were studied and taken as a baseline of the OP.
2. Three workshops were held with the partners. Firstly, a workshop was organised with Odisee, the Center for Gastrology, Zorgwaard, and ILVO. The aim of this workshop was to gather feedback on the first draft of the profile that was created in step 1 and 2. These partners are partners that now work in PFC, offer the current curriculum of the CGE, or are CGEs themselves. After this feedback was processed, a second and third workshop was organised with all partners that are considered to contribute to T2.2. The workshops were held on two subsequent days with different partners, but with the same methodology. The collaboration tool of Miro was used, so partners could work on a whiteboard together. In this workshop, the definition of the OP was discussed first by all participating partners, then partners were asked to explain what key activities are relevant for CGEs in their view, and thirdly, the corresponding competences.
3. D2.1.2 Collection of good practices was then analysed to ensure the OP met all the criteria and competences that were found in this report.

After these steps, a working document was created in which all feedback was integrated, and partners could comment on the OP together. After the integration of the feedback, all partners were again invited to a 2-hour workshop to discuss all key activities and competences one by one. After integrating the feedback again, five chefs in Austria and Belgium were consulted to give their insights. The head of training of Dieticians and a practice lecturer of Dieticians were also asked in Belgium and Italy to give their feedback and ensure the feasibility of the profile. After integrating all the remaining comments, all partners were given one week to check the profile and give their final feedback before the OP was ready for submission.

### 8.2 Definitions in the OP

Each ESCO occupation (10) is related to essential and optional knowledge, skill and competence concepts:

- **Essential** are those knowledge, skills and competences that are usually relevant for an occupation, independent of the work context, employer or country.
- **Optional** are those knowledge, skills and competences that may be relevant or occur when working in an occupation depending on the employer. Optional knowledge, skills and competences are very important for job matching because they reflect the diversity of jobs within the same occupation.



Within NECTAR, different competences will be identified for the CGE. Essential competences are matched with the related key activity, but the optional ones are considered as 'contextual competences'. Due to experiences in other Erasmus+ projects of partners and discussions held between partners, it was found that within the context of NECTAR, the terminology of contextual was more applicable. As all pilot countries have different entry levels regarding the EQF, it depends on the context what contextual skills should be provided in each country.

The skills pillar of ESCO includes knowledge, skills and competences that are defined as follows:

- **Competence:** The proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations, and in professional and personal development.
- **Knowledge:** The body of facts, principles, theories and practices that is related to a field of work or study. Knowledge is described as theoretical and/or factual, and is the outcome of the assimilation of information through learning.
- **Skill:** The ability to apply knowledge and use know-how to complete tasks and solve problems. Skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments).

## 9 Results – The Profile

### 9.1 The Proposal

According to the NECTAR proposal, a CGE combines science, craft and art. He does this to control, improve and renew culinary production and distribution systems. He also fine-tunes information and communication systems, structures and processes for the benefit of his customers. Everything is done in a technical, hygienic, organoleptic and nutritionally responsible manner. The chef also takes into account quality requirements, costs and the socio-economic and cultural context.

Overall, a CGE:

- Is responsible for the quality of food and food management in PFC (hospitals, care homes, home care);
- Controls ingredients, preparations and availability of meals;
- Addresses taste deteriorations (related to aging) and taste alterations (e.g. for oncological treatments) and swallowing and chewing problems providing taste anamnesis, personalizing recipes and cooking processes and preparations, and modifying food textures;
- Is (through the aid of ICTs) responsible for meal deliveries at the elderly's homes to improve the health and independence of older adults living in the community and to help prevent malnutrition;
- Understands crucial challenges as food sustainability, waste management, and allergens.

Developing new job profiles to deliver integrated care for older citizens, which enables them to participate in diagnostic and interventional team-based working, is one of the answers to windows and opportunities to develop pre-existing workforce in a goal-oriented way. ICTs and Engineering, crucial for CGE, will be key elements for active and healthy ageing as well as education over the next decade.

Job specific skills include “gastro-engineering ”skills about:

- Taste and Sensory
- Taste and Health
- Menu engineering
- Cooking and Distribution Process Systems + Quality Assurance
- Technology of Cooking and Distribution Processes
- Basics of Nutrition and Dietetics
- Food Chemistry and Biochemistry

Additional skills include:

- Financial Analysis and Planning
- The Basics of Applied Law
- Ethics and Cultural Embeddedness

## 9.2 Analysis of different OP in ESCO

The occupations pillar is one of the three pillars of ESCO. It organises the occupation concepts in ESCO. It uses hierarchical relationships between them, metadata as well as mappings to the **International Standard Classification of Occupations** (ISCO) in order to structure the occupations. In ESCO, each occupation is mapped to exactly one ISCO-08 code. ISCO-08 can therefore be used as a hierarchical structure for the occupations pillar. ISCO-08 provides the top four levels for the occupations pillar. ESCO occupations are located at level 5 and lower (11).

ISCO (12) has created different Occupation groups that have been developed to facilitate international comparison of occupational statistics and to serve as a model for countries developing or revising their national occupations classifications. **Cooks** include a wide range of occupations involved in the preparation of meals including chefs, cooks, short order cooks and fast food preparers. **Chefs** are identified as a separate unit group in Major Group 3: Technicians and Associate Professionals, reflecting the higher skill level requirements. Therefore, within NECTAR, the main focus will be on Chefs.

Chefs, classified in Unit Group 3434, plan and develop recipes and menus, create dishes and oversee the planning, organisation, preparation and cooking of meals, whilst cooks, classified in Unit Group 5120, plan, organise, prepare and cook a range of dishes, they do so according to recipes or under the supervision of chefs. They do not generally develop menus or create new dishes.

According the Occupational Profile of Chefs within ESCO and ISCO (13) the Chefs design menus, create dishes and oversee the planning, organisation, preparation and cooking of meals in hotels, restaurant and other eating places, on board ships, on passenger trains and in private households.

**Tasks** include:

- Planning and developing recipes and menus, estimating food and labour costs, and ordering food supplies
- Monitoring quality of dishes at all stages of preparation and presentation
- Discussing food preparation issues with managers, dieticians and kitchen and waiting staff
- Supervising and coordinating the activities of cooks and other workers engaged in food preparation

- Inspecting supplies, equipment and work areas to ensure conformity with established standard
- Determining how food should be presented, and creating decorative food displays
- Instructing cooks and other workers in the preparation, cooking, garnishing and presentation of food
- Participating in the recruitment of kitchen staff and monitoring their performance
- Preparing, seasoning and cooking speciality foods and complex dishes
- Explaining and enforcing hygiene and food safety regulations

According to Open Risk Manual (14), the ISCO Occupation Group 3434.1 Chef can be defined as: Chefs are culinary professionals with a flair for creativity and innovation to provide a unique gastronomic experience. Table 1 shows the essential and optional **Skills** for Chefs.

Essential Skills	Optional Skills
Control Of Expenses	Assist Customers
Instruct Kitchen Personnel	Apply Procurement
Dispose Waste	Set Prices Of Menu Items
Maintain Kitchen Equipment At Correct Temperature	Cook Fish
Use Cooking Techniques	Execute Chilling Processes To Food Products
Use Culinary Finishing Techniques	Cook Seafood
Use Reheating Techniques	Create Decorative Food Displays
Use Food Preparation Techniques	Ensure Cleanliness Of Food Preparation Area
Handover The Food Preparation Area	Cook Dairy Products
Manage Staff	Prepare Canapés
Maintain Customer Service	Cook Sauce Products
Work In A Hospitality Team	Check Deliveries On Receipt
Comply With Food Safety And Hygiene	Order Supplies
Think Creatively About Food And Beverages	Prepare Sandwiches
Use Food Cutting Tools	Prepare Salad Dressings
Store Raw Food Materials	Train Employees
Plan Menus	Cook Pastry Products
	Prepare Flambeed Dishes
	Compile Cooking Recipes
	Prepare Desserts
	Schedule Shifts
	Identify Nutritional Properties Of Food
	Handle Chemical Cleaning Agents
	Cook Vegetable Products
	Cook Meat Dishes

**Table 1. Essential and optional skills ISCO Occupation Group 3434.1 Chef**

The CGE will also function as a **Head Chefs**. Head Chefs manage the kitchen to oversee the preparation, cooking and service of food (15). The essential and optional **Skills** of a Head Chef can be found in Table 2.

Essential Skills	Optional Skills
Manage Budgets	Negotiate Supplier Arrangements
Use Culinary Finishing Techniques	Execute Chilling Processes To Food Products
Handle Chemical Cleaning Agents	Identify Suppliers
Ensure Regular Maintenance Of Kitchen Equipment	Cook Pastry Products
Estimate Costs Of Required Supplies	Plan Medium To Long Term Objectives
Set Prices Of Menu Items	Create Decorative Food Displays
Apply Procurement	Manage Inspections Of Equipment
Handover The Food Preparation Area	Manage Medium Term Objectives
Control Of Expenses	Upsell Products
Handle Customer Complaints	Manage Contract Disputes
Train Employees	Attend To Detail Regarding Food And Beverages
Compile Cooking Recipes	Forecast Future Levels Of Business
Use Reheating Techniques	Advise Guests On Menus For Special Events
Maintain A Safe, Hygienic And Secure Working Environment	Think Creatively About Food And Beverages
Comply With Food Safety And Hygiene	Check Deliveries On Receipt
Use Food Preparation Techniques	Prepare Flambeed Dishes
Supervise Food Quality	
Food Storage	
Plan Menus	
Use Cooking Techniques	
Recruit Employees	
Assist Customers	
Monitor The Use Of Kitchen Equipment	
Schedule Shifts	
Manage Hospitality Revenue	
Keep Up With Trends In Eating Out	
Manage Stock Rotation	
Manage Staff	

**Table 2. Essential and optional skills ISCO Occupation Group 3434.1.1 Head Chef**

As a CGE does not only work as a chef, but also work in a healthcare, the definition ISCO Specialization 5120.1.1 **Diet Cook** shall also be considered. A Diet cook prepares and presents meals according to special dietary and nutrition needs (16). A Diet cook is also known as Health Care Cook, Special Diet Cook, Nursery Cook, Dietary Aide, Nursing Home Cook, Dietary Cook or Diet Chef and has the essential and optional **Skills** that are presented in Table 3.

Essential Skills	Optional Skills
Handover The Food Preparation Area	Check Deliveries On Receipt
Maintain Kitchen Equipment At Correct Temperature	Store Kitchen Supplies
Use Food Cutting Tools	Advise On Preparation Of Diet Food
Store Raw Food Materials	Prepare Sandwiches
Receive Kitchen Supplies	Cook Sauce Products
Work In A Hospitality Team	Handle Chemical Cleaning Agents
Use Culinary Finishing Techniques	Prepared Meals
Composition Of Diets	Prepare Egg Products For Use In A Dish
Use Reheating Techniques	Cook Seafood
Maintain A Safe, Hygienic And Secure Working Environment	Cook Dairy Products
Use Food Preparation Techniques	Slice Fish
Identify Nutritional Properties Of Food	Cook Vegetable Products
Comply With Food Safety And Hygiene	Plan Menus
Use Cooking Techniques	Order Supplies
Ensure Cleanliness Of Food Preparation Area	Create A Diet Plan
Dispose Waste	Prepare Meat Products For Use In A Dish
Nutrition	Prepare Ready-Made Dishes
	Cook Meat Dishes
	Control Of Expenses
	Prepare Vegetable Products For Use In A Dish
	Execute Chilling Processes To Food Products
	Comply With Standard Portion Sizes
	Prepare Desserts
	Prepare Salad Dressings
	Prepare Saucier Products For Use In A Dish
	Prepare Bakery Products
	Prepare Dairy Products For Use In A Dish
	Train Employees

**Table 3. Essential and optional skills ISCO Occupation Group 5120.1.1 Diet Cook**

To understand the essential and optional skills better, an analysis is made that lists all the skills mentioned in the Occupation Group of the Chef, the Head Chef and the Diet Cook, counting the times it is classified as an essential or optional skill. The list can be found in Table 4, in which C = Chef, H = Head Chef, and D = Diet Cook.

Skill	Essential	Optional
Advise Guests on Menus for Special Events		H
Advise on Preparation of Diet Food		D
Apply Procurement	H	C

Assist Customers	H	C
Attend To Details Regarding Food and Beverages		H
Check Deliveries On Receipt		C, H, D
Compile Cooking Recipes	H	C
Comply With Food Safety And Hygiene	C, H, D	
Comply with Standard Portion Sizes		D
Composition of Diets	D	
Control Of Expenses	C, H	D
Cook Dairy Products		C, D
Cook Fish		C
Cook Meat Dishes		C, D
Cook Pastry Products		C, H
Cook Sauce Products		C, D
Cook Seafood		C, D
Cook Vegetable Products		C, D
Create a Diet Plan		D
Create Decorative Food Displays		C, H
Dispose Waste	C, D	
Ensure Cleanliness Of Food Preparation Area	D	C
Ensure Regular Maintenance Of Kitchen Equipment	H	
Estimate Costs Of Required Supplies	H	
Execute Chilling Processes To Food Products		C, G, D
Food Storage	H	
Forecast Future Levels of Business		H
Handle Chemical Cleaning Agents	H	C, D
Handle Customer Complaints	H	
Handover The Food Preparation Area	C, H, D	
Identify Nutritional Properties Of Food	D	C
Identify Suppliers		H
Instruct Kitchen Personnel	C	
Keep Up With Trends in Eating Out	H	
Maintain A Safe, Hygienic And Secure Working Environment	H, D	
Maintain Customer Service	C	
Maintain Kitchen Equipment At Correct Temperature	C, D	
Manage Budgets	H	
Manage Contract Disputes		H

Manage Hospitality Revenue	H	
Manage Inspections of Equipment		H
Manage Medium Term Objectives		H
Manage Staff	C, H	
Manage Stock Rotation	H	
Monitor the Use of Kitchen Equipment	H	
Negotiate Supplier Arrangements	H	
Nutrition	D	
Order Supplies		C, D
Plan Medium to Long Term Objectives		H
Plan Menus	C, H	D
Prepare Bakery Products		D
Prepare Canapés		C
Prepare Desserts		C, D
Prepare Egg Products for Use in a Dish		D
Prepare Flambeed Dishes		C, H
Prepare Meat Products for Use in a Dish		D
Prepare Ready-Made Dishes		D
Prepare Salad Dressings		C, D
Prepare Sandwiches		C, D
Prepare Saucier Products for Use in a Dish		D
Prepare Vegetable Products for Use in a Dish		D
Prepared Meals		D
Receive Kitchen Supplies	D	
Recruit Employees	H	
Schedule Shifts	H	C
Set Prices Of Menu Items	H	C
Slice Fish		D
Store Kitchen Supplies		D
Store Raw Food Materials	C, D	
Supervise Food Quality	H	
Think Creatively About Food And Beverages	C	H
Train Employees	H	C
Upsell Products		H
Use Cooking Techniques	C, H, D	
Use Culinary Fishing Techniques	C, H, D	



Use Food Cutting Tools	C, D	
Use Food Preparation Techniques	C, H, D	
Use Reheating Techniques	C, H, D	
Work In A Hospitality Team	C, D	

**Table 4. Analysis of Skills of different relevant Occupation Groups**

This analysis results in the following Skills that should be considered in the CGE OP:

- The following Skills are **essential** for **all** Occupational Groups: Comply with Food Safety and Hygiene, Handover the Food Preparation Area, Use Cooking Techniques, Use Culinary Fishing Techniques, Use Food Preparation Techniques and Use Reheating Techniques.
- The following Skills are **essential** or **optional** for **all** Occupational Groups: Control of Expenses, Plan Menus.
- The following Skills are **essential** for **two** Occupational Groups: Dispose Waste, Maintain A Safe, Maintain A Safe, Hygienic And Secure Working Environment, Manage Staff, Store Raw Food Materials, Use Food Cutting Tools, Work In A Hospitality Team.

## 9.3 Analysis of EU Skills Panorama

The EU Skills Panorama was checked for cooks and chefs, but no relevant information was found. Food preparation workers are the only occupation that entails the preparation of food, but the level cannot be compared to those of a cook or a chef according to ISCO Occupation Group 3434.1 Chefs. This is a result pointing out the need of work in this field. NECTAR could provide information to the EU Skills Panorama database at the end of the project.

## 9.4 Additional information about existing qualifications and certifications

### 9.4.1 Europe

The core of the EQF is its **eight reference levels** defined in terms of **learning outcomes**, i.e. knowledge, skills and autonomy-responsibility. Learning outcomes express what individuals know, understand and are able to do at the end of a learning process. Countries develop **national qualifications frameworks** (NQFs) to implement the EQF (17). As NECTAR focusses on EQF4 (Portugal, Italy) EQF (4+)/5 (Austria) and EQ5 (Belgium), the corresponding EQFs are shown in Table 5.

The learning outcomes are defined in terms of:

- **Knowledge:** in the context of EQF, knowledge is described as theoretical and/or factual.
- **Skills:** In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).



- **Responsibility and autonomy:** In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility.

Knowledge	Skills	Responsibility and Autonomy
<b>Level 4 – Learning Outcomes</b>		
Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change; supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
<b>Level 5 – Learning Outcomes</b>		
Comprehensive, specialized, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others

Table 5. EQF4 and EQ5

### 9.4.2 Belgium

Eurydice (18) describes that the European **qualifications framework** distinguishes **8 levels**, which go from level 1 to level 8. Each level in the framework is described by means of a **level descriptor**. The **Flemish qualifications framework is also split into 8 levels**. The Flemish qualifications framework provides a generic description of the characteristics of the competences that pertain to the qualifications at that level and comprises five descriptor elements: knowledge, skills, context, autonomy and responsibility. They determine the level of the qualification. The level descriptors are used to describe and classify both educational and vocational qualifications.

### 9.4.3 Austria

The Austrian NQF (19) is a reference system intended to **classify qualifications** of the Austrian education and training system by means of an **eight-level structure**. The Austrian NQF functions as a tool for information, guidance and orientation. It does not serve as a regulator and the referencing of qualifications to a certain NQF level does not grant any legal rights or entitlements to qualification holders. The NQF descriptors are based on the EQF descriptors and describe learning outcomes in **three dimensions** (knowledge, skills, competence). To support qualification providers in the process of referencing their qualifications to an NQF level, the NQF manual provides more detailed specifications that put the EQF descriptors into a more practical and national context.

At levels one to five, qualifications of all education sectors are referenced on the basis of the NQF descriptors. At levels six to eight, **two sets of descriptors** apply – the NQF descriptors and the Dublin descriptors. Whereas qualifications of the Bologna architecture acquired at HE institutions (**bachelor, master, PhD, diploma studies**) are referenced according to the Dublin descriptors, referencing of all other qualifications is carried out on the basis of the NQF descriptors.

#### 9.4.4 Portugal

In Portugal (20), the Ordinance no. 782/2009, 23<sup>rd</sup> July, using the principles of the European Qualifications Framework (EQF) in relation to the description of national qualifications in terms of learning outcomes. In January 2011, it was established that all certificates and diplomas issued from October 1st, 2010, onwards, and which confer a qualification featured in the NQF, must include a reference to the respective level of qualification (Order no. 978/2011, 12th January), which provides greater legibility and transparency in understanding qualifications obtained in the system.

#### 9.4.5 Italy

The QNQ, (National Qualification Framework /Quadro Nazionale delle Qualifiche) was established by Ministerial Decree in 2018, and is the tool to describe and classify the qualifications (according to the Decr. L. n.13/2013)(19). The function of the QNQ is to link the Italian qualification framework to the qualification framework of the other European countries (21).

The Framework is organised according to the three main higher education levels as defined through the Bologna Process and it shows the qualifications released for each cycle as well as the relative ECTS credits and learning outcomes (Dublin descriptors).

The same decree establishes the Atlas of Jobs and Qualifications (Atlante del Lavoro e delle Qualificazioni) based on the classification of economic/professional sectors and for each professional profile is described: the contents of the job and products or services erogabile through 23 SEP (Settori Economico - Professionale) economic/professional sectors and 1 Sector named “Common Area” which includes all the processes supporting the production of goods and services.

The SEP are described in working processes, process sequencing, and Areas of Activity/ Aree di Attività - ADA.

The ADA is the main information unit of the Atlas, and contains the description of each tasks (min 4 max 12), products and services expected and expected learning outcomes, a collection of case histories, as well as the ISTAT (National Institute of Statistics) codes.

The Atlas published in 2015 by INAPP National Institute for Public Policy Analysis /Istituto Nazionale per l'Analisi delle Politiche Pubbliche together with the Italian Regions, as part of the construction of the National Directory of education and training qualifications and professional qualifications, it is, moreover, a useful tool to support the lifelong learning system, employability, and guidance services.

### 9.5 Best practices

Derived from D2.1.1 Report on existing training initiatives and curricula for cooks in the PFC, Table 6 shows the frequency of the competences of the best practices related to education of chefs in PFC. Although no real best practices could be found that met all the criteria as described in the conclusion of D2.1.1, the analysis gives a good overview on the current situation in Europe, the need of a new OP for the CGE, and core competences that should be considered, e.g. the menu engineering.

Competences	WIFI	BE	DGE	IHK	University of Naples Federico II	Marco Polo	Frequency
<b>Working context</b>							
<i>knowledge of nutritional medicine</i>	✓	✓	✓	✓	✓	✓	6
basic nutritional knowledge (nutritional recommendations, nutrition science, nutrients, reference values, nutrition trends)	✓		✓	✓	✓	✓	5
anatomy/physiology (function of digestive organs, metabolism)	✓		✓	✓			3
disease patterns (structure, function of digestive organs, metabolism)	✓		✓	✓			3
chemistry (biochemistry, food chemistry)	✓		✓			✓	3
specific nutritional needs for different age groups (adults, seniors, small children)			✓	✓			2
nutritional therapies, diet forms (gastroenterological, neurological/functional, for metabolic diseases, for food allergies)	✓	✓	✓	✓		✓	5
elements of genetics of taste						✓	1
biodiversity of natural resources (botanic, Mediterranean ecosystem)					✓		1
<i>processing and passing on information (channels, content, communication rules, methods, gateways, languages)</i>				✓	✓	✓	3
<i>formulating work instructions (preparation and structure, implementation, use of organizational tools, delegation, control and feedback)</i>				✓		✓	2
<i>instructing and training staff (guidance of staff, staff training)</i>				✓			1
<b>Organize procedures and prepare and distribute meals</b>							
<i>evaluate and use products</i>	✓	✓	✓	✓	✓	✓	6
characteristic properties of food and products	✓		✓	✓	✓	✓	5
provision of food and products and storage	✓		✓	✓		✓	4
checking the possible uses of foods and products (list of ingredients, visual and sensory inspection, assessment)		✓		✓			2

<i>plan processes and preparation (equipment, preparation of recipes for specified cost forms, taking into account dietetics and nutrient preservation, hygiene)</i>	✓	✓	✓	✓	✓	✓	6
<i>quality management (design and document within the framework, responsibility and commitment, communication, standards, HACCP)</i>	✓	✓	✓	✓	✓	✓	6
<i>food safety (toxic substances, pollutants, microbiology, vulnerable groups, biotechnological food safety, traceability)</i>	✓	✓			✓	✓	4
<i>food preparation according to specifications (cooking and kitchen techniques, according to special dietary requirements, with special food)</i>			✓	✓	✓	✓	4
<i>environmental protection (reduce waste, sustainability)</i>	✓					✓	2
<i>food distribution (process systems, equipment)</i>		✓					1
<i>media use and evaluation of content (procedure of literature and internet research)</i>				✓			1
<i>target group-specific data (dividing people into target groups with regard to nutrition, determining and preparation of target group-specific data)</i>				✓			1
<b>Menu engineering (create nutrient-defined meal plans)</b>							
<i>menu plans development</i>	✓	✓	✓	✓	✓	✓	6
<i>specifications and conditions (regional and seasonal conditions, therapy support, prevention, budget, personnel, ecolabel certification)</i>	✓	✓		✓	✓	✓	5
<i>implementation techniques (choice of ingredients, constellation of recipes, calculation of nutrients)</i>			✓	✓		✓	3
<i>types of plans (weekly, daily, organic)</i>		✓		✓		✓	3
<i>basis for planning (dietary rules of country, reference values)</i>			✓	✓			2
<i>legal framework of dietetics (dietary regulation, standards)</i>	✓	✓		✓	✓		4
<i>nutrient calculations (quantitative and qualitative assessment, nutrient composition)</i>				✓			1
<i>diet catalogues and health-promoting food offers (prevention measures, guidelines, relationship between diet-related diseases and food, diet catalogue developing)</i>				✓			1

<i>individual needs (special living conditions, adaption of nutrients and food, nutrient deficiency)</i>				✓			1
<i>elements of different cuisine (local, regional, national and international traditional)</i>						✓	1
<b>Support nutrition education and upbringing</b>							
<i>marketing campaigns for food (marketing measures, recording of guest satisfaction, design of the food offer)</i>				✓	✓	✓	3
<i>history and culture (history of taste in the West, history of gastronomy in countries of Mediterranean Sea, relationship between food, culture and society)</i>		✓			✓	✓	3
<i>advice on health-promoting foods (planning counselling, counselling talks)</i>				✓		✓	2
<i>technical cooking consultations (planning cooking advice, space, time, duration, content)</i>				✓		✓	2
<i>information for different target groups (children, pupils, adults, seniors, patients)</i>				✓			1
<i>event planning (planning, task allocation, involvement of interdisciplinary team, implementation, evaluation)</i>				✓			1
<b>Skills training</b>							
<i>practical lessons (internship, practical cooking, excursion, workshops)</i>	✓	✓	✓		✓		4
<b>Corporate knowledge</b>							
<i>economics &amp; strategies (corporate organization, company's strategies, business plan, business management, ISO standards and choice factors)</i>					✓	✓	2
<i>sales and Marketing for business (customer satisfaction survey, sales techniques)</i>							
<i>software management (specific technical terminology)</i>						✓	1
<i>commercial law</i>						✓	1
<i>safety for workers</i>						✓	1
<i>budgeting and accounting (analytical accounting, quantifying the size of the economic investment, sustainability assessment, cost control)</i>						✓	1

**Table 6. The frequency of the competences of the best practice curricula**

## 9.6 Results of the Workshops

Based on all the research conducted in the previous chapters, three initial workshops were conducted with the partners.

The first workshop was conducted with the Center for Gastrology, ILVO and Zorgwaard (Belgium & the Netherlands). The reason for having the first workshop with these partners was that these partners currently offer the curriculum for the CGE, or al CGE themselves, indicating that their first opinion and views are highly important for the development of the OP.

Looking at the current profile, the current competences of the Occupation Groups of Chefs in Unit Group 3434 of ISCO are considered to be a good entry level to enter the curriculum of the CGE. Looking at the Head Chefs within that Group, many competences should be added to the new profile, especially those considering management and communication in the kitchen. Also, it was stated that the current skills of the Head Chefs and Chefs are slightly outdated: a lack was found in sustainable cooking (e.g. being able to identify local suppliers, cooking with seasonal products).

The second and third were held with MIRO<sup>2</sup> on two consecutive days, involving all partners involved in T2.2. Firstly, the definition was openly discussed, which resulted in the brainstorm presented below. Almost all partners had the same understanding of the CGE. A focus, amongst others, was found on understanding the patient's diet needs and designing recipes for them, working in an interdisciplinary healthcare team, overall knowledge on food and health, and leading and managing the kitchen. When describing the profile, the partners found it important to describe the context of the definition and make it understandable for lay people.

WORKSHOP OCCUPATIONAL PROFILE CGE

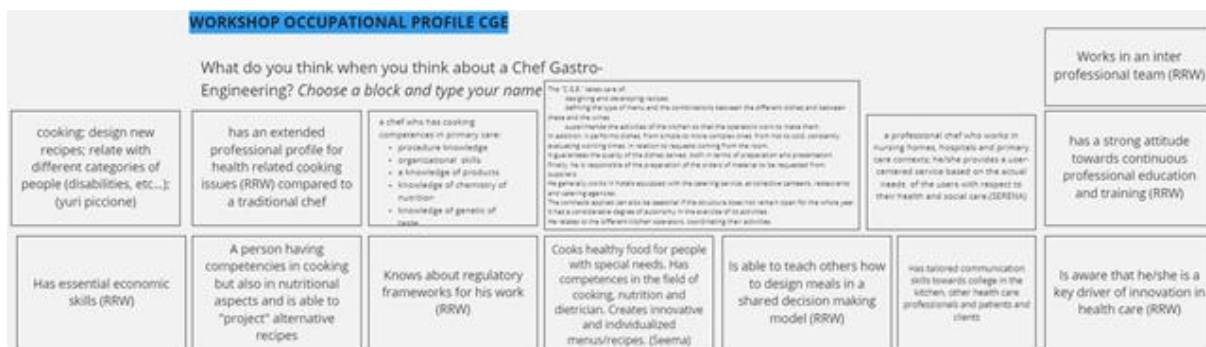
What do you think when you think about a Chef Gastro-Engineering? *Choose a block and type your name*

<p>Heidi:</p> <p>Leadership in the kitchen: Create/engineer dishes/recipes: Cooking skills at chef level; Gastrology knowledge: Special food and nutrition know-how: Communication skills: Medical background knowledge (target-specific: concerning people with special nutrition needs); Know-how on specific nutrition effects: Cooperation in specialist team</p>	<p>(Valentina Comiani)</p> <ul style="list-style-type: none"> <li>knowledge of the nutritional value of foods</li> <li>the Mediterranean diet and lifestyle</li> <li>knowledge of common diseases</li> <li>how the nutrition impact ageing</li> <li>Knowledge of conservation and elaboration of food in order to keep the nutritional values (low-temperature cooking etc.)</li> <li>Able to understand and use the medical glossary</li> <li>knowledge of local culinary tradition/recipes</li> </ul>	<p>Lucia Schifano:</p> <p>understanding patient's diet needs; teamworking with specialist; leadership in the kitchen; designing customized palatable menus for elderly people</p>
---	---	---

chef who can design food regarding diets, counsel patients and find the right menu/food choice meeting diet requirements of dietitians and wishes/taste of patient, modern kitchen techniques, work in an interdisciplinary team (understand specialist terms), understand work of dietitians, nurses and doctors.

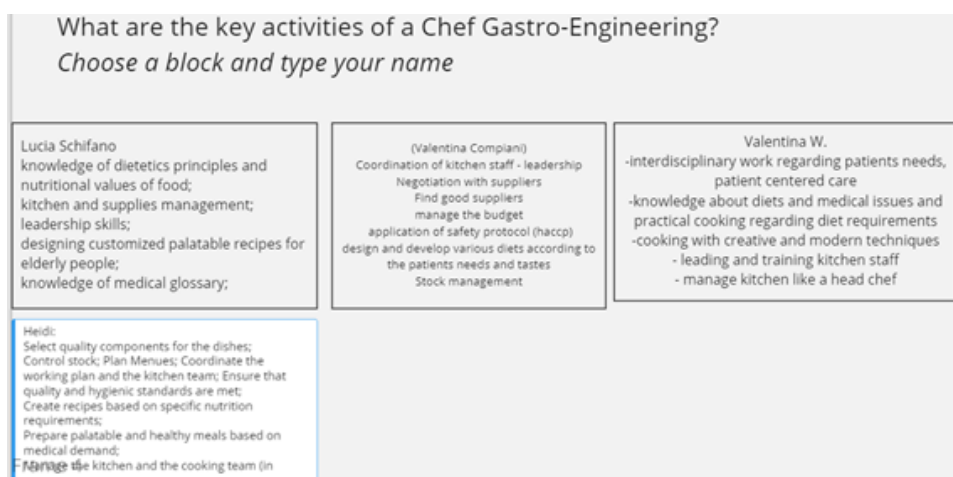
**Figure 1. Definition CGE 1**

<sup>2</sup> MIRO is a whiteboard tool designed for co-creation: <https://miro.com/>

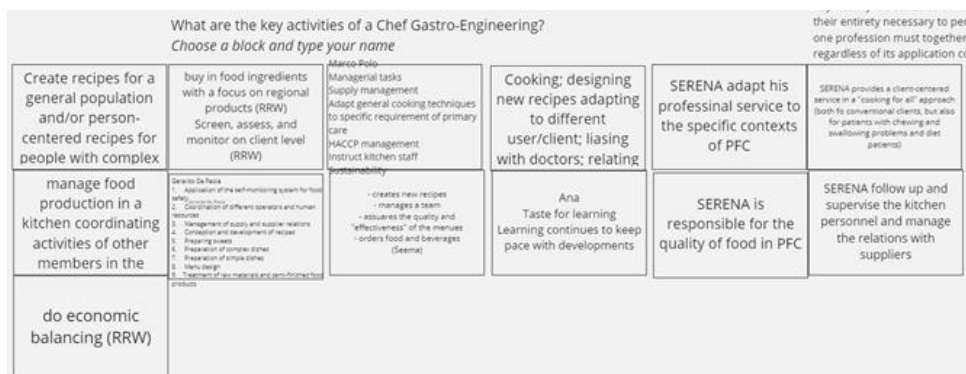


### Figure 2. Definition CGE 2

Secondly, the results of identifying the key activities of the two workshops are displayed below. Again, both workshops led to similar key activities. Some key activities that were mentioned on the whiteboard could also be seen as competences, therefore some duplicates are found. Nevertheless, topics that were discussed include the management of suppliers and sustainable food ingredients, screening, assessing and monitoring on client-level, creating recipes for a general population and/or person-centred recipes for people with complex care needs, ensuring the food quality and hygiene in the kitchen, being able to cook personalised meals and communicating, interacting and collaborating with users.



**Figure 3. Workshop key activities CGE 1**



**Figure 4. Workshop key activities CGE 2**

Lastly, the identification of the core competences can be found below. Most partners described very similar core competences that should be included in the OP of the CGE and can be linked to the key activities.



First brainstorm: put here all the competences you can think about	What are the core competences of a Chef Gastro-Engineering?		
<ul style="list-style-type: none"> <li>-communicate with doctors, nurses, dietitians, patients</li> <li>-medical knowledge about relevant diseases, anatomy, physiology and pathology</li> <li>-knowledge about diets (especially for older people) like diabetes, kidney diet, metabolic syndrom...</li> <li>-practical realization of dietary requirements and patients taste wishes</li> <li>knowledge about ingredients, nutritional value, season of ingredients, etc...</li> <li>..designing new meals to meet new needs of patients (healthy veggy food e.g.).</li> <li>ordering and stocking ingredients</li> <li>trains staff</li> <li>quality control, HACCP - Valentina W.</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>
<ul style="list-style-type: none"> <li>Head:</li> <li>Development of menu plans</li> <li>Communication with kitchen staff and with medical staff</li> <li>Creation of menus based on special nutrition requirements</li> <li>Management of kitchen</li> <li>Management of staff</li> <li>Stock management</li> <li>Engineering of recipes</li> <li>Cooking/food preparation</li> <li>Hygienic management</li> <li>Quality management in gastro</li> <li>Purchasing knowledge</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>
<ul style="list-style-type: none"> <li>Lucia Schifano</li> <li>understanding patient's diet needs;</li> <li>teamworking with specialist;</li> <li>leadership in the kitchen;</li> <li>designing customized palatable menus/recipes for elderly people;</li> <li>knowledge of dietetics principles and nutritional values of food and medical glossary;</li> <li>mastering all kitchen activities;</li> <li>understanding patient's diet needs; teamworking with specialist;</li> <li>leadership in the kitchen; designing customized palatable menus for elderly people</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>	<ul style="list-style-type: none"> <li>• ability to find local suppliers to meet the budget and to reach good quality food km0</li> <li>• be able to design and develop various diets taking into account seasonality of foods, customers need (health and tastes), and budgets</li> <li>• Be able to communicate with medical staff (good knowledge of medical glossary and needs of the most common diseases)</li> <li>• Kitchen management/ stock management/ etc...</li> <li>• (Valentina Complani)</li> </ul>

Figure 5. Workshop competences CGE: left first workshop, right second workshop

The last workshop with all partners was intended to go through all key activities and competences one by one through screen sharing in Microsoft Teams. All partners were in line with the content of the key activities and competences, but the phrasing was improved. Especially focusing on the differences in job profiles of the interdisciplinary team the CGE works in and the target groups were pointed out.

The chefs consulted provided confirmation about the content of the profile and added a few minor comments about the hygiene and safety of the food in the kitchen. The head of training of dieticians and the practice lecturer also confirmed the quality of the profile, but added to be careful about a CGE and patient files, as the CGE is not a medical practitioner and is only allowed to view food related details of the patient.

## 9.7 Definition

The initial definition of the CGE as presented in the proposal is the following:

“The CGE combines science, craft and art to control, improve and renew culinary production, distribution and information / communication systems, structures and processes for the benefit of the client, in a technical, hygienic, organoleptic and nutritionally responsible manner, taking into account the quality requirements, the costs and the socio-economic and cultural context.”

However, the consortium firstly proposed the definition below, that was resulted from the workshops: “The chef gastro-engineering (CGE) is a chef working an interdisciplinary team around people and delivering person-centred food care. The CGE combines evidence-based knowledge on food



and health, monitors, innovates and communicates culinary production in a technical, hygienic, sensory and nutritionally responsible manner. The chef considers the quality requirements for food, the costs and the socio-economic and cultural context of the client.”

Nevertheless, as it is necessary to have consequent scientific definitions whilst describing the CGE, the final definition is based on the paper in process called “Introducing the concept ‘Primary Food Care’, ‘Gastroogy’ and Gastro-Engineering to Prevent Malnutrition in Healthcare and to Promote Active and Healthy Ageing – The EIP-AHA Nutrition Action Group” (Goossens E, Van den Wijngaert L, van Gemst M, van Reenen E, De Cock A, Corremans M, Vlaemynck G, Geurden B, 2021), resulting in the following:

“The Chef Gastro-Engineering (CGE) primarily produces tasty, healthy and safe meals that are appropriate for the end-users in a particular context. In healthcare, the CGE combines science, craft and art to manage all gastrological aspects of Primary Food Care (PFC). The chef engineers culinary cooking systems, as well as distribution and information/communication structures and processes, including the designing, building, operating, maintaining, improving and innovating of these systems for the benefit of all end-users. Based on his/her primary professional profile, the CGE is capable to do all this in a technical, organoleptic and nutritionally responsible way. At the same time, the CGE is taking all relevant quality requirements, food safety, socio-economic ecological aspects, and cultural embeddedness of food into account.”

## 9.8 Linking the CGE OP to ESCO

ESCO, the classification of European Skills, Competences, Qualifications and Occupations, aims to serve as a common reference for the world of labour market and the world of education and training. It offers an occupation pillar and a skills and competences pillar and is linked to International Classifications such as ISCO and ISCED and to the EQF. ESCO occupations provide a good basis for creating new occupational profiles and vocational training programmes as they define the skillset needed to perform an occupation in relation to the background of the economic sector (22). The CGE OP is therefore developed on the basis of analyzing relevant ESCO occupations and their skillsets (see chapter 9.2).

While ESCO can on one hand be used as a basis for the definition of new occupational profiles and vocational programmes, it will on the other hand be updated and improved on a regularly basis. The continuous improvement workflow for ESCO foresees in this context of feedback collection the following inputs:

- **National and international classifications** of occupations, knowledge, skills and competences: These classifications are usually maintained by Members States authorities or European/International organizations and reflect changes in the labour market or in the education sector. The Improvement workflow for ESCO points out that if “a new occupation is added in several national classifications, this can be a strong indication for a new occupation in the labour market” (23).
- **Repositories of big data sources** containing information on occupations, knowledge, skills and competences: for example, EURES, Europass, the EU Skills Panorama, private and public job boards.
- **Studies** on current and future skills demand and supply, on new trends in the labour market or in education and training: these are for example published by the Commission, Member State authorities, CEDEFOP, social partners, industry associations, researchers etc.

- **Stakeholder register:** register of important stakeholders during the process of the continuous improvement of ESCO (24)

This means, that there are several ways to link the CGE to ESCO: One option is the integration of the CGE OP into official national occupational classifications that are linked to ESCO should be promoted in all NECTAR partner countries and Public Employment Services who maintain those classifications should be kept on track about the CGE OP development. Although national occupational classifications are at present in many cases mapped to ESCO it has to be taken into account that several countries use ESCO directly for national purposes (25).

The implementation of the CGE OP into ESCO could be supported by publishing at national and European level studies that refer to the skills demand in this field. Further proofs for the labour market relevance of the occupation (e.g.: many job vacancies in job boards) could also be helpful, but during the development phase of the OP and the training offer, they will be difficult to provide.

The consortium can in addition to the mentioned activities make efforts to be included in the stakeholder register and to gain visibility for the CGE OP at European level. The ESCO Secretariat should be contacted to propose the implementation of the CGE and its skillset into ESCO (for example as a specialization of Head Chef) once the profile is available in a final version.

Another possibility to link the CGE to ESCO is to focus on the qualification: The qualification pillar of ESCO has been migrated to Europass in July 2020. It includes information on European qualifications that come from databases of national qualifications reflecting the National Qualifications Frameworks of the European Member States (23). As national qualifications that have been mapped to the NQF of a European country are referenced to the EQF and the EQF is linked to ESCO, these national qualifications will be connected to ESCO and will – because of the migration of the ESCO qualifications to Europass - become a part of the Europass repository of qualifications that is used for the Europass course finder. At present (March 2021), qualifications from the following European Member States can be found (26):

- Belgium
- Czechia
- Estonia
- Germany
- Greece
- Hungary
- Iceland
- Latvia
- Lithuania
- Malta
- Netherlands
- Poland
- Portugal
- Slovenia
- Serbia
- Sweden

For the CGE this means, that if the qualification can be mapped to a NQF of one or more NECTAR partner countries, it will be connected to ESCO (via the EQF). And since ESCO qualifications feed the Europass course finder, they might also be displayed there.

## 10 The final Occupational Profile of the CGE

### 10.1 Definition

*The Chef Gastro-Engineering (CGE) primarily produces tasty, healthy and safe meals that are appropriate for the end-users in a particular context. In healthcare, the CGE combines science, craft and art to manage all gastrological aspects of Primary Food Care (PFC). The chef engineers culinary cooking systems, as well as distribution and information/communication structures and processes, including the designing, building, operating, maintaining, improving and innovating of these systems for the benefit of all end-users. Based on his/her primary professional profile, the CGE is capable to do all this in a technical, organoleptic and nutritionally responsible way. At the same time, the CGE is taking all relevant quality requirements, food safety, socio-economic ecological aspects, and cultural embeddedness of food into account.*

### 10.2 Summary of Key Activities and Competences

Key Activity	Related Core Competence
1. Manage suppliers and buy in sustainable food ingredients	<ul style="list-style-type: none"> <li>Identify costs of required supplies</li> <li>Identify most sustainable and high-quality suppliers and plan and manage the supply process related to the context</li> <li>Avoid and manage waste while planning meals to promote full use of ingredients and promoting re-use according to HACCP and local law</li> <li>Use local and seasonal ingredients and detect them in the territory to guarantee an efficient supply for the kitchen</li> </ul>
2. Screen, assess and monitor on client-level	<ul style="list-style-type: none"> <li>Adapt screening, assessment and monitoring activity on the base of the proper level of care and use ICT tools to support this</li> <li>Critically select and use the proper screening and monitoring tools to assess individual food preferences and needs</li> <li>Assess clients' needs with respect taste deterioration</li> <li>Collaborate with health professionals to understand how to alternate food texture regarding swallowing problems or other relevant adapted food medical conditions (e.g. Dementia, diabetes, kidney diseases)</li> <li>Detecting clients' satisfaction and impressions after food consumption experience with interdisciplinary team</li> </ul>
3. Create recipes for a general population and for people with specific needs, complying with recommendations of health professionals	<ul style="list-style-type: none"> <li>Create or compile recipes targeted to the general population considering cultural choices or religious ones and put them in a balanced and tasteful menu</li> <li>Create and compile adapted and person-centred recipes complying with recommendations of health professionals as far as physiological (age-related) and pathological conditions</li> <li>Handle food related client data in ICT systems</li> <li>Supply menus and balanced menu cycles</li> </ul>
4. Manage the kitchen and coordinate personnel	<ul style="list-style-type: none"> <li>Manage the kitchen budget (e. g. make budget plans and assure they are followed) with respect to food and utilities</li> <li>Recruit personnel for the kitchen with HR recruiting team and define, create, implement and control training plans and schedules</li> <li>Schedule personnel shifts and manage staff</li> <li>Ensure regular maintenance of kitchen equipment</li> </ul>

5. Ensure quality of food and follow safety regulations	<ul style="list-style-type: none"> <li>Assure that the work of the kitchen staff is compliant with food safety and hygienic standard and maintain a secure working environment</li> <li>Acquire and ensure high food quality and safety in the kitchen starting from raw and semi-finished food products materials, storage of raw materials, processing, cooking and storage of food (components) and regenerating it</li> <li>Plan and execute food tasting for healthcare professionals to test and review menus and new dishes</li> </ul>
6. Use and adapt cooking techniques to the specific care setting and client	<ul style="list-style-type: none"> <li>Use the proper cooking techniques according to the healthcare context</li> <li>Use the proper food preparation techniques for the right context</li> <li>Use specific techniques of food preparation considering personal healthy diets and cultural and religious choices</li> <li>Adapt food consistency, fortification and taste according to the needs of the client</li> </ul>
7. Communicate, interact and collaborate with clients and interprofessional team	<ul style="list-style-type: none"> <li>Effectively interact and communicate with different clients and the interprofessional team with verbal (also written) and non-verbal communication</li> <li>Collaborate with healthcare professionals to educate and promote healthy behaviours among clients</li> <li>Work in a person-centred interdisciplinary team and collaborate with other professionals or stakeholders</li> </ul>

**Table 7. Summary of Key Activities and Competences**

## 11 Literature

1. Organization WH. European Food and Nutrition Action Plan 2015–2020. World Health Organization Europe ROF; 2014. Report No.: Regional Committee for Europe 64th Session.
2. Tappenden KA, Quatrara B, Parkhurst ML, Malone AM, Fanjiang G, Ziegler TR. Critical role of nutrition in improving quality of care: an interdisciplinary call to action to address adult hospital malnutrition. *J Acad Nutr Diet.* 2013;113(9):1219-37.
3. Keller HH, Vesnaver E, Davidson B, Allard J, Laporte M, Bernier P, et al. Providing quality nutrition care in acute care hospitals: perspectives of nutrition care personnel. *J Hum Nutr Diet.* 2014;27(2):192-202.
4. Murphy JL, Holmes J, Brooks C. Nutrition and dementia care: developing an evidence-based model for nutritional care in nursing homes. *BMC Geriatr.* 2017;17(1):55.
5. Organization WH. Health21. The health for all policy framework for the WHO European Region. Copenhagen: World Health Organization Regional Office for Europe 1999. 224 p.
6. Illario M, Maione AS, Rusciano MR, Goossens E, Rauter A, Braz N, et al. NutriLive: An Integrated Nutritional Approach as a Sustainable Tool to Prevent Malnutrition in Older People and Promote Active and Healthy Ageing—The EIP-AHA Nutrition Action Group. *Advances in Public Health.* 2016;2016:5678782.
7. Organization WH. Primary health care. Now more than ever. Geneva: World Health Organization; 2008.
8. Mak T, Caldeira S. The Role of Nutrition in Active and Healthy Ageing. For prevention and treatment of age-related diseases: evidence so far. 2014.
9. ESCO - ESCOpedia - European Commission [Internet]. Europa.eu. 2020 [cited 2021 Mar 1]. Available from: <https://ec.europa.eu/esco/portal/escopedia/Occupation>
10. ESCO - European Skills, Competences, Qualifications and Occupations ESCO handbook: PART I – WHAT IS ESCO? [cited 2021 Mar 2] Available from: <https://ec.europa.eu/esco/portal/document/en/0a89839c-098d-4e34-846c-54cbd5684d24>
11. ESCO. Beroepen. 2020. Available from: <https://ec.europa.eu/esco/portal/occupation>
12. ESCO – European Skills, Competences, Qualifications and Occupations. Occupations. 2020. [cited 2021 Mar 2]. Available from: <https://ec.europa.eu/esco/portal/occupation?resetLanguage=true&newLanguage=en>
13. International Standard Classification of Occupations: Structure, group definitions and correspondence tables. 2020 [cited 2021 Mar 2]. Available from: <https://www.ilo.org/public/english/bureau/stat/isco/docs/publication08.pdf>
14. Open Risk Manual . ISCO Occupation Group 3434.1 Chef. [cited 2021 Mar 5]. Available from: [https://www.openriskmanual.org/wiki/ISCO\\_Occupation\\_Group\\_3434.1\\_Chef](https://www.openriskmanual.org/wiki/ISCO_Occupation_Group_3434.1_Chef)
15. Open Risk Manual . ISCO Occupation Group 3434.11 Head Chef. [cited 2021 Mar 5]. Available from: [https://www.openriskmanual.org/wiki/ISCO\\_Specialization\\_3434.1.1\\_Head\\_Chef](https://www.openriskmanual.org/wiki/ISCO_Specialization_3434.1.1_Head_Chef)
16. Open Risk Manual . ISCO Occupation Group 5120.1.1 Diet Cook. [cited 2021 Mar 5]. Available from: [https://www.openriskmanual.org/wiki/ISCO\\_Specialization\\_5120.1.1\\_Diet\\_Cook](https://www.openriskmanual.org/wiki/ISCO_Specialization_5120.1.1_Diet_Cook)
17. Cedefop. European Qualifications Framework (EQF). 2018 [cited 2021 Mar 8]. Available from: <https://www.cedefop.europa.eu/en/events-and-projects/projects/european-qualifications-framework-eqf> ;2018
18. Eurydice. Belgium – Flemish Community. 2018 [cited 2021 Mar 8]. Available from: [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-3\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-3_en);
19. Eurydice. Austria. 2020 [cited 2021 Mar 8]. Available from: [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-1\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-1_en)
20. Eurydice. Portugal. 2018 [cited 2021 Mar 8]. Available from: [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-60\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-60_en)

21. Eurydice. Italy. 2021 [cited 2021 Mar 8]. Available from: [https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-39\\_en](https://eacea.ec.europa.eu/national-policies/eurydice/content/national-qualifications-framework-39_en)
22. European Commission. 2019. ESCO Annual Report 2019. <https://ec.europa.eu/esco/portal/document/de/0d744eb5-e613-465d-a8df-2a0efe02c444>, p. 24
23. European Commission. 2017. Continuous improvement workflow for ESCO. <https://ec.europa.eu/esco/portal/document/en/f834e202-0ebf-461a-9249-a00e91d86e94>, p. 6.
24. European Commission. 2018. ESCO implementation manual. <https://ec.europa.eu/esco/portal/document/de/6d66d96b-f2d9-405f-be49-15dbcc31f99c>, p. 12
25. ESCO portal: <https://ec.europa.eu/esco/portal/qualification?resetLanguage=true&newLanguage=en> and [https://ec.europa.eu/esco/portal/escopedia/ESCO\\_v1](https://ec.europa.eu/esco/portal/escopedia/ESCO_v1)
26. Europass course finder: [https://europa.eu/europass/en/find-courses?keyword=&location=&eqf\\_level=6&thematic\\_area=cook&order=relevance&op=Find&form\\_build\\_id=form-bqi2dtKjIWM1G6MF21FPsaJ7KNAYSCe644XhlaeZDXw&form\\_id=courses\\_search](https://europa.eu/europass/en/find-courses?keyword=&location=&eqf_level=6&thematic_area=cook&order=relevance&op=Find&form_build_id=form-bqi2dtKjIWM1G6MF21FPsaJ7KNAYSCe644XhlaeZDXw&form_id=courses_search)