



UP4HEALTH

Sustainable and cost-effective production process for the upcycling of olive, grape and nut by-products into 4 natural and healthy ingredients for nutraceutical and cosmetic applications

Project number: 888003

D7.5 Report on the contribution to standardization (Part I)

Due date of deliverable: 31/05/2022

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PROJECT INFORMATION

Project full title: Sustainable and cost-effective production process for the upcycling of olive, grape and nut by-products into 4 natural and healthy ingredients for nutraceutical and cosmetic application

Acronym: UP4HEALTH

Call: H2020-BBI-JTI-2019

Topic: BBI-2019-S03-D3



Start date: June 1st 2020

Duration: 48 months

List of participants:

Partner No.	Name	Acronym
1 (Coordinator)	Isanatur	ISA
2	Contactica	CTA
3	Laboratorios Amerex	AMX
4	Zade Vital	ZADE
5	Biozoon	BZN
6	Aurora Intelligent Nutrition	AIN
7	Indukern	IK
8	Universidad de Vigo	UVIGO
9	Instituto Politécnico de Bragança	IPB-CIMO
10	Technological University Dublin	TUDublin

DELIVERABLE DETAILS

Document Number:	D7.5
Document Title:	Report on the contribution to standardization (Part I)
Dissemination level	Confidential, only for members of the consortium (including the Commission Services).
Period:	PR 2
WP:	WP 7 Regulatory and market access aspects
Task:	Task 7.3 Standardization activities
Author:	  Kim A. Millar, Lubna Ahmed, Catherine Barry-Ryan
Abstract:	<p>UP4HEALTH D7.5 is produced in the context of WP7, Task 7.3 – <i>Standardization activities</i>. The purpose of this report is to update the consortium on the activities to date, that have contributed to this task. These activities include communications with the consortium, the Spanish Association for Standardization (UNE), who are subcontracted to the UP4HEALTH project to provide support regarding the standardization tasks included in the project, and communication with relevant technical committees.</p> <p>An overview of the actions commenced to date and the outcomes, is provided, along with a schedule of planned activities for the next reporting period.</p>

LIST OF ABBREVIATIONS

AFNOR	Association Française de Normalisation
BSI	British Standards Institution
CEN	European Committee for Standardization
INSO	Iran National Standards Organization
ISO	International Standards Organisation
NEN	Nederlands Normalisatie-instituut
SC	Subcommittee
TC	Technical committee
TR	Technical Report
TSE	Turkish Standards Institution
UNE	Spanish Association for Standardization
WG	Working group

1 INTRODUCTION

The standardization system is combines technical committees, subcommittees, working groups, standards and technical documents covering a vast number of subjects. In order to contextualize and manage the process for UP4HEALTH, the relevant committees and documents were identified in Deliverable 7.4 which related to the UP4HEALTH research activities. They were characterized by categories as pertaining to the research activities, and the relevant work packages and partners were identified with them.

Table 1 Key technical committees identified in D7.4 for future activities

Technical Committee	Subject area	Work Packages	Secretariat
ISO/TC 34/SC 2 - Oleaginous seeds and fruits and oilseed meals	Sampling methods, physical-chemical analysis	WP 2,	AFNOR
ISO/TC 34/SC 3 - Fruits and vegetables and their derived products	Sampling, product specifications, testing methods	WP 1, 2	TSE
ISO/TC 34/SC 11 - Animal and vegetable fats and oils	Methods for sampling and analysis	WP 2	BSI
ISO/TC 217 - Cosmetics	Analytical methods, microbiological standards and limits	WP 6, WP 7	INSO
CEN/TC 411 - Bio-based products	Sampling, certification tools, bio-based content	WP 3	NEN

Several gaps were identified in the availability of standards related to Up4Health activities, particularly with regard to extraction and characterization of fibers and polyphenols with respect to bioavailability, bio accessibility and bioactivity. There are also no technical committees for development of standards specifically for dietary supplements at the European or International level.

A strategy was outlined with the support of, the Spanish Association for Standardization (UNE), who are subcontracted by TU Dublin, to make the interaction with the standardization system be most effective, efficient and fruitful as possible, through the definition of several actions including:

- Follow up on standardization activities related to UP4HEALTH through updates from UNE;
- Communication and collaboration with existing standardization technical committees and organizations:
 - Identify and contact the standardization technical committees which can have a stronger link with the project;
 - Participation of one or more UP4HEALTH partners in ongoing works of some technical committees;
 - Dissemination of the UP4HEALTH progress by reporting to the relevant technical committees or attending the relevant technical committee meetings.

Deliverable 7.4 was submitted to the consortium in September 2021, M16. At the 3rd General Assembly, a brief summary of the deliverable was presented to the consortium along with an overview of the planned activities for the contribution to standardization. The partners were informed that a survey would be sent out following the General Assembly in order to gather information that was required to define the strategy and identify the project needs and potential avenues for standardization.

2 STRATEGY

The Project's outcomes with potential to be standardized will be identified by UNE, together with the partners. The best standardization track for each outcome will be defined by UNE and with this information, decisions will be taken about the next steps together with the partners. These actions may include:

- Proposal for, and participation in modification of existing standard(s).
- Proposal and development of new standardization document(s), such as CEN Workshop Agreement (CWA), CEN or ISO Technical Specifications (TS) or Technical Reports (TR). CWA is usually the best suited option for R&I projects

2.1 What actions are to be taken

The actions required to progress the standardization activities for UP4HEALTH can be broadly discussed under two categories:

- A. Those carried out directly within the standardization system. These are the activities facilitated by TU Dublin and supported by UNE;
- B. Those performed within the consortium as support for the above (A). These correspond to specific needs identified during the project development.

With respect to the specific actions that can progress the contribution to standardization and the subsequent development of deliverable 7.6, several potential activities have been defined:

1. The follow up of the standardization activity through updates reported by UNE. This would include updates to ongoing projects within TCs and WGs, revisions to relevant standards. This information can be included as updates to Deliverable 7.4.
2. WP 7 meetings organized by TU Dublin. These meetings will facilitate the identification of project needs, and the sharing of relevant information or project findings, between the partners and UNE, in order to support the progression of the standardization activities.
3. Introduction of the UP4HEALTH project to the relevant committees (see Annex C) and requesting feedback or a meeting where applicable.
4. Facilitating the follow up through joining and participation of on ore more UP4HEALTH partners to a standardization committee. As standardization is an open process, all interested parties may participate in a CEN/ISO TC through its National Standardization Body.
5. The establishment of a Project Liaison with a TC. Under this liaison, the consortium could participate as an entity in the TC (without voting rights). This action would only be advisable when the TC is developing a related standard during the life of the project.

Depending on the assessment by the UP4HEALTH partners, along with UNE, of the impact of the identified technical committees on their tasks, and the level of contribution that their results can represent for these committees, several activities can be performed by the consortium partners, including:

1. Contributing to working groups or standards under development.
2. Contributing feedback or modifications on existing standards employed by the UP4HEALTH partners.

3. Requesting information from TCs. E.g., general or specific questions put to the TCs regarding UP4HEALTH activities or possibilities for standards.
4. Contribute findings / outcomes to relevant technical committees to contribute new knowledge for the development or modification of new/existing standards or documents
 - a. E.g., Methodology to perform the LCA of Xylooligosaccharides from bio-mass.
5. Identifying gaps in the standardization landscape, as relevant to UP4HEALTH activities, and contributing proposals for the development of new standards relevant to the activities and outcomes of UP4HEALTH
 - a. Life-cycle assessment with specific regard to the food production sectors
 - b. Social Life-cycle assessment
 - c. Life-cycle costing
 - d. Analysis of meat quality, i.e., colour, oxidation
 - e. Determination / analysis of dietary fibres in foods/supplements
 - f. Toxicity analysis with respect to food extracts i.e., mutagenicity, genotoxicity, cytotoxicity.

2.2 Which committees can be contacted

Deliverable 7.4 presented the landscape of both European and International technical committees which are relevant to the Up4Health project activities. The following working groups / subcommittees have been identified with active work programmes related to the Up4Health activities.

European Committee for Standardization, CEN

- CEN/TC 275/WG 3 – Pesticides
- CEN/TC 275/WG 10 – Elements and their chemical species
- CEN/TC 275/WG 13 – Process contaminants
- CEN/TC 411/WG 3 – Bio-based content
- CEN/TC 411/WG 4 – Sustainability criteria, life-cycle analysis and related issues

International Standards Organization, ISO

- ISO/TC 34/SC 10/WG 12 – Phytase activity
- ISO/TC 34/SC 16 – Horizontal methods for molecular biomarker analysis
- ISO/TC 34/SC 20 – Food loss and waste
- ISO/TC 34/WG 14 – Vitamins, carotenoids and other nutrients
- ISO/TC 34/WG 21 – Social responsibility/sustainability
- ISO/TC 34/WG 26 – Plant-based foods
- ISO/TC 207/SC 5 – Life-cycle assessment
- ISO/TC 217 – Cosmetics
- ISO/TC 323 – Circular economy

2.2.1 Ongoing projects related to the UP4HEALTH activities

Several relevant documents have been initially identified as related to some UP4HEALTH activities

CEN/TC 275:

- prEN 17851 (WI=00275368) Analysis of Foodstuffs - Determination of Ag, As, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Ti, U and Zn in foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS) after pressure digestion
- prEN 13806 rev (WI=00275373) Determination of mercury by atomic fluorescence spectrometry (AFS) - cold vapour technique after pressure digestion
- prEN 13806 rev (WI=00275375) Foodstuffs - Determination of trace elements - Determination of mercury by cold-vapour atomic absorption spectrometry (CVAAS) after pressure digestion
- prEN 13806 rev (WI=00275374) Determination of mercury in food with atomic absorption directly from the foodstuff (elemental mercury analysis)
- CEN/TC 307
- prEN ISO 734 (WI=00307195) Oilseed meals - Determination of oil content - Extraction method with hexane (or light petroleum) (ISO/DIS 734:2022)

3 ACTIVITIES AND OUTCOMES

Table 2: Summary of actions carried out between M12 and M24

Action	Date	Description	Outcome
Information request to the partners	Aug 2021 (M15)	Excel file sent out to all partners to gather initial information regarding methods / standards being employed by the partners and any requests they had for standards. This information was collected to direct the standardization landscape for the project.	During the filling period, 9 partners answered the questions with varying levels of detail.
Deliverable 7.4	Sept 2021 (M16)	A report on the standardization landscape as relevant to UP4HEALTH was prepared. This collected existing standards, lists of technical committees and working groups relevant to the project, an outline of potential standardization activities.	Submission of Deliverable 7.4
First project meeting with UNE	Nov 2021 (M18)	Kick-off meeting with UNE, following contract signing, to introduce ourselves and discuss a broad strategy for the projects.	Agreed a strategic overview and outline of activities planned for M20 - M36.
Information request to the partners	Jan 2022 (M20)	A questionnaire was sent out to all partners to gather general information about standards being used, standardization needs, participation and information on possible future new standards.	During the filling period, 4 partners answered the questions with different levels of detail according their use or knowledge of standards.
Project meeting with UNE	Feb 2022 (M21)	Meeting with UNE to discuss the information required to introduce the project to the relevant technical committees.	Agreed on a presentation to prepare to introduce the project to the relevant TCs.
Project meeting with UNE	April 2022 (M23)	Meeting with UNE to discuss the material for dissemination to the TCs and the options available to the consortium for interaction with standardization system.	Finalised the presentations for initial communication with the TCs. It was agreed that TU Dublin would commence WP 7 meetings with individual partners and Elena would attend. It was agreed that first communication with TCs would follow initial WP 7 meetings.
WP 7 meetings	June 2022(M25)	WP 7 meetings are scheduled to commence in June, 2022, M25. These will be individual partner meetings with TU Dublin and our UNE representative. These meetings will seek to gather information that can be relevant for communications with TCs, i.e., feedback on existing standards, projects, or gaps in standards. We will also discuss what potential standardization activities are applicable to the relevant WPs / tasks.	Scheduled to commence M25, June 2022.

4 SCHEDULE OF ACTIVITIES

The schedule of activities is dependent on the outcome of the planned WP meetings. A summary of the possible dissemination actions is presented in Table 3

Table 3: Summary of possible dissemination activities.

Action	Responsible
Follow up of TCs standardization activities	TU Dublin
Presentation of project to TCs	TU Dublin
Participation in a TC	TU Dublin, Partners
Providing feedback on existing standards	Partners
Delivering reports to TCs	TU Dublin
Information requests to TCs	TU Dublin, Partners

5 CONCLUSIONS

During the period M12-M24, the standardization landscape was prepared and communicated to all partners and the planned activities were discussed at the UP4Health General Assembly in M19. The contract with the Spanish Association for Standardization, UNE, was secured and communications commenced via online meetings.

Deliverable 7.5 is the first report on the contribution to standardization, due for submission in month 24. The activities which contribute to this deliverable are highly dependent on the findings and deliverables which are generated by the other WPs in UP4HEALTH.

The roadmap for standardization is reliant on the information provided by the project partners, in order to identify the project needs. The survey on standardization (see Annex A) was disseminated with the aim to gather information from the partners, that could be useful for the standardization technical committees, and thus, serve as a mean to approach them. For this reason, the survey was designed to obtain information on specific standards that are in use by the project, or aspects that could be standardized, and to be used as a link between technical committees and UP4HEALTH partners. Four partners participated in completing the questionnaire, however, little information has been provided regarding their use of standards or future standardization proposals, which is required for approaching committees.

As a result of this, the need for dedicated WP 7 meetings was identified. TU Dublin will facilitate these meetings between UNE and the consortium (on an individual partner basis). Information will be provided on how the partners can get involved in standardization, focusing on the UP4HEALTH project needs, and how it can benefit the partners and the consortium as a whole. Following these meetings, TU Dublin will be better positioned to identify the most relevant ongoing projects within CEN and ISO that the partners could contribute feedback to. The first WP meeting has been scheduled for June 14th with Contactica.

After the WP meetings have commenced, the presentation for the TCs (see Annex B) will be updated and disseminated to the committees / working groups which are identified as being the most relevant. A more detailed roadmap for standardization can be defined and Deliverable 7.5 can be updated in due course.

ANNEX A: PARTNER QUESTIONNAIRE

WP: WP 7. REGULATORY AND MARKET ACCESS ASPECTS

TASK: TASK 7.3. STANDARDIZATION ACTIVITIES

AUTHOR: KIM A. MILLAR, KIM.MILLAR@TUDUBLIN.IE



PARTNER:

1. Is your UP4HEALTH task affected by any European legislation (Directives, regulations...)?

Please refer to Deliverable 7.2 for this.

YES Biozoon, Amerex, Zade,

NO IPB-CIMO

If yes, please list the relevant legislation.

Biozoon	Reg. (EC) No. 852/2004, CR (EC) No 2023/2006, Reg. 8EC) No. 1925/2006, Reg. (EC) 1924/2006, Reg. (EU) No 1169/2011, Reg. (EU) 2283/2015, Reg. (EU) No 609/2013
Amerex	Regulation (EC) No 178/2002, Regulation (EC) No 1935/2004, Regulation (EC) No 1924/2006, Regulation (EU) No 1169/2011, Regulation (EU) No 609/2013, Commission Regulation (EC) No 2073/2005, General Principles for Food Hygiene CXC 1-1969, Guidelines on nutrition labelling CAC/GL 2-1985 and General Standard for the Labelling of Pre-packaged Foods CXS 1-1985. Commission Regulation (EC) No 1881/2006
Zade	Regulation EC no 178/2002 , 1935/2004 , 1924/2006 , 1169/2011 , 609/2013 , 1223/2009 , 2073/2005, Directive 2002/46 EC General principles for food hygiene CXC 1-1969 Guidelines on nutrition labelling CAC/GL 2-1985 Guidelines for vitamin and mineral food supplements CAC/GL 55-2005

2. Is your organisation participating in any **standardization technical committees (TC)**, **working groups** or similar (National, European, or International, ISO, CEN, etc.), already identified in Deliverable D7.4?

YES Zade

NO Biozoon, Amerex, IPB-CIMO

- a. If yes, please specify the technical committee, working group or similar, in which your organisation is participating:

Zade	ISO/TC 34/SC 3, ISO/TC 34/SC 11, ISO/TC 34/SC 16, ISO/TC 34/SC 9, ISO/TC 34/SC 17, ISO/TC 34/SC 2, ISO/TC 34/SC 12, ISO/TC 217, ISO/TC 276, ISO/TC 93, ISO/TC 147, ISO/TC 34/SC 10 CEN/TC 275, CEN/TC 338, CEN/TC 327, CEN/TC 463, CEN/TC 411
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- b. If no, please identify which working group or committee your organisation is willing to participate in:
Click or tap here to enter text.

3. Within the framework of the UP4HEALTH project, is your organisation using European or International standards (or other European documents) among those identified in Deliverable D7.4?

YES Amerex,

NO Biozoon, Zade, IPB-CIMO

- a. If yes, specify what standards/documents you are using and provide feedback on these standards.

Amerex	ISO 15214:1998, ISO 16649-2:2001, ISO 11290-1:2017
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4. What aspect of your task do you think should be standardised (ingredient specifications, selection criteria, processing & downstream processing etc.) to facilitate production, safety requirements and market acceptance?
Please give details.

Click or tap here to enter text.

5. What deliverables or findings from your UP4HEALTH task would be relevant for the development of new standards or modification of existing standards?
Please give details

Click or tap here to enter text.

6. In order to upscale and market your Up4Health ingredients for the marine / agri-food industries in the future, would a standard/document in common with the rest of this industry, or other sectors (European or world-wide) be useful?

YES Biozoon, Zade

NO Amerex, IPB-CIMO

- a. Please specify what type of standards and how this would be useful.

Zade	There is no market regulation around xylooligosaccharides. Zade would like to lead in this area.
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7. Please add here any other information regarding your task/deliverables and standardization that you may deem relevant.

Amerex	Some rules which may be relevant, especially for Spanish partners, are shown in the document "2017 NORMAS MICROBIOLÓGICAS DE LOS ALIMENTOS Y ASIMILADOS (Enero 2017)". We recommend reading it.
IPB-CIMO	Related to WP4, we are currently using the INFOGEST methodology, a consensus model for in vitro digestion studies that was last updated in Nature Protocols (Brodkorb et al. 2019). INFOGEST established a protocol and guidelines for the study of digestion and is accepted as the standard for in vitro digestion studies. INFOGEST is also an international research network that was created as a result of a COST action (https://www.cost-infogest.eu/).

ANNEX B: UP4HEALTH GENERAL PRESENTATION FOR ISO AND CEN TECHNICAL COMMITTEES



Sustainable and cost-effective production process for the upcycling of olive, grape and nut by-products into 4 natural and healthy ingredients for nutraceutical and cosmetic applications

THIS PROJECT HAS RECEIVED FUNDING FROM THE BIO-BASED INDUSTRIES JOINT UNDERTAKING (JIU) UNDER GRANT AGREEMENT NO 1010000. THE JIU RECEIVES SUPPORT FROM THE EUROPEAN UNION'S HORIZON 2020 RESEARCH AND INNOVATION PROGRAMME AND THE BIO-BASED INDUSTRIES CONSORTIUM.

 16 Partners
  5 Countries
  48 Months
  4m Funding






Fibre



Oil extracts



Fruit water



Prebiotics

1. INTRODUCTION
2. THE PROJECT
3. IMPACT
4. STANDARDISATION






Introduction – The Project Consortium


ISANATUR
— NUTRITION & HEALTH —


contactica
#INNOVATION


amerex


biozoon
Food innovation group


INDUKERN


ZADEVITAL
NATURAL SUPPLEMENTS



ipb INSTITUTO POLITÉCNICO DE BRAGANÇA


AURORA
Intelligent nutrition


DUBLIN
NUTRITION PARTNERSHIP


Universidade de Vigo



Introduction – Project Concept

The Challenges:

- The need of an economic & environmentally sustainable solution for the management of industrial food by-products.
- The lack of a cost-efficient process at large scale for the recovery of bio-based functional ingredients from food by-products.
- To satisfy the increasing demand for natural and sustainable functional ingredients and products.


The Solution:

UP4HEALTH provides the demonstration at pre-industrial scale of an integrated biorefinery for the recovery of valuable biomolecules from food processing by-products and their conversion into natural, healthy and sustainable high added-value products for the nutraceutical and cosmetic sectors.

The UP4HEALTH upcycling process integrates a unique zero waste sustainable process for 4 locally available Mediterranean feedstocks (olive pomace, grape pomace, nut by-products & olive pits) to deliver 4 organic, natural, sustainable & healthy ingredients:

The UP4HEALTH ingredients will be integrated into functional foods, nutraceutical supplements and cosmetics. These ingredients will be of suitable quality to meet market requirements of consumers and industry.






Introduction – Project Concept

The UP4HEALTH project involves key actors present during the whole value chain. Access to raw material providers and potential end users is endorsed thanks to support letters provided.



BIOMASS
Olive, grape, nut by-products



BIOPROCESSING
Fermentation with yeast
Fibre, Oil, Fruit water



INDUSTRIAL APPLICATIONS



CONSUMERS

RAW MATERIAL PROVIDERS






INDUSTRIAL APPLICATIONS



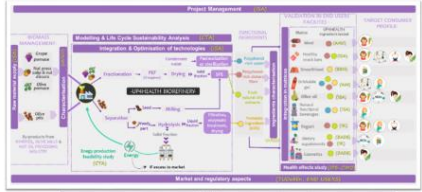


Final consumers involved through consumers studies for product acceptance






Introduction – Project Overview





The diagram illustrates the project's structure, including the Project Management team, the UP4HEALTH Consortium, and the various stakeholders involved in the project. It also highlights the project's goals and the expected outcomes.

Standardisation in UP4HEALTH



UP4HEALTH partners seek to participate in ongoing works of the identified TCs and WGs by

- Contributing to working groups or standards under development
 - CEN/TC 275**
 - prEN 17851 (WI=00275368)** Analysis of Foodstuffs - Determination of Ag, As, Cd, Co, Cr, Cu, Mn, Mo, Ni, Pb, Se, Tl, U and Zn in foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS) after pressure digestion
 - prEN 13806 rev (WI=00275373)** Determination of mercury by atomic fluorescence spectrometry (AFS) - cold vapour technique after pressure digestion
 - prEN 13806 rev (WI=00275375)** Foodstuffs - Determination of trace elements - Determination of mercury by cold-vapour atomic absorption spectrometry (CVAAS) after pressure digestion
 - prEN 13806 rev (WI=00275374)** Determination of mercury in food with atomic absorption directly from the foodstuff (elemental mercury analysis)
 - CEN/TC 307**
 - prEN ISO 734 (WI=00307195)** Oilseed meals - Determination of oil content - Extraction method with hexane (or light petroleum) (ISO/DIS 734:2022)
 - CEN/TC 411**
 - prEN 16785-1 rev (WI=00411018)** Bio-based products - Bio-based content - Part 1: Determination of the bio-based content using the radiocarbon analysis and elemental analysis

Standardisation in UP4HEALTH

- Contributing feedback or modifications on existing standards employed by the UP4HEALTH partners
- Contribute findings / outcomes to relevant technical committees to contribute new knowledge for the development or modification of new/existing standards
 - E.g., Methodology to perform the LCA of Xylooligosaccharides from bio-mass
- Identifying gaps in the standardisation landscape, as relevant to UP4HEALTH activities, and contributing proposals for the development of new standards relevant to the activities and outcomes of UP4HEALTH
 - Life-cycle assessment with specific regard to the food production sectors
 - Social life-cycle assessment
 - Life-cycle costing
 - Analysis of meat quality, i.e., colour, oxidation
 - Determination / analysis of dietary fibres in foods/supplements
 - Toxicity analysis with respect to food extracts i.e., mutagenicity, genotoxicity, cytotoxicity

Standardisation in UP4HEALTH

Challenges facing standardisation within the up4health Project:

- Limited technical committees or working groups in the research areas for UP4HEALTH
- Partner's lack of knowledge about standards, standardisation activities and the benefits of standardisation, results in poor engagement with the process
- Reluctance of SME's to disseminate findings

