LIFE Project Number

LIFE15 ENV/GR/000257

LIFE PROJECT NAME or Acronym

LIFE-F4F (Food for Feed)

Action:	C1 Monitoring of the impact of the project actions
Partner:	Harokopio University of Athens (HUA)
Deliverable:	Deliverable C.1.5 Assessment of the project's socioeconomic impacts

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Table of contents

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Introduction

Background

Food waste is one the most prominent issues humanity currently faces. According to the United Nations (UN), it is estimated that 17% of the total global food production is wasted, while in a European Union (EU) level, the amount of food that is wasted reaches up to 88 million tonnes per year. Food waste is associated with socio- economic and environmental issues. From an environmental perspective, food waste generates around 8% to 10% of the global greenhouse emissions, while 38% of the energy used to produce food is also wasted. The social impact is equally important, given that approximately 700 million people are currently hungry, reaching the 8.9% of the world population. Unfortunately, this number increases when considering the people who do not have regular access to a nutritious diet. International organizations, such as the UN, have underlined the need to minimize and better manage food waste; in fact, one of the most important Sustainable Development Goals (SDGs) is to achieve Zero Hunger by 2030, something that is not going to be realized, especially if food waste production and management does not change.

However, introducing an effective change is not a simple task; waste management has been- and still is- a challenge for governments and institutions. EU is promoting the food- waste hierarchy that indicates the best and worst options regarding food waste management. According to this plan, the best option is to reduce the production of food waste; among the effective solutions is the use of food waste as animal feed, after the necessary process. This is a rather competent option, given that not only food waste is diverted from environmentally harmful types of management, but also the problem of covering the needs of the increasing livestock in a word of depleted resources is treated. As San Martin et al. (2016) mention, it is possible to reduce vegetable waste up to 70% by producing animal feed. Additionally, the cost of livestock production can be reduced through the adoption of this practice (Pinotti et al, 2021). Currently, within the EU there are legislative obstacles related to the use of food waste as feed and as a result, approximately only 3 million tonnes of food waste is processed for the production of animal feed (Salemdeeb et al, 2016). Nevertheless, there have been multiple successful cases of recycled food waste to animal feed around the world. Countries such as Japan, South Korea and Taiwan have managed to recycle 40% of their food waste into animal feed. Besides that, in Europe multiple programs and projects take place, exploring this field and its opportunities and limitations; one of these projects is the F4F for which this assessment is realized.

Project Description

European Union is a leading figure regarding environmental and social issues. During the past years it has set specific goals and has implemented multiple programs aiming at the protection of the natural environment and biodiversity.

The European LIFE F4F project is a pilot project that aims at the transformation of food waste to animal feed through an innovative and simple technology that utilizes an altered solar drying process, characterized by low emissions. Thus, the main object of this pilot project is to develop an alternative way of managing food waste and further explore the possibility of implementing this new approach on a larger scale. The project is realised in Crete, and it targets 4- and 5-star hotels in the highly touristic areas of Heraklion and Hersonissos. The process (Image 1) that will be followed in this project begins at the hotels, where food consumption takes place. As a result, food waste is produced and separated in different flows. Then, the separated waste is transported to the unit constructed specifically for the needs of the project, where the hand sorting and the solar drying is implemented. Finally, through this process the feed component is produced that will be transported to the collaborating retailers so that it will be available for consumption.

Deliverable Objective

The aim of this deliverable is to assess the socioeconomic impacts of this project. To do so, the methodology known as Social Life Cycle Assessment (SLCA) will be applied, following the guidelines that have been developed by the United Nations Environmental Program (UNEP) and the Society of Environmental Toxicology and Chemistry (SETAC). The goal of this methodology is to identify both the negative and positive impacts of the F4F process life cycle, which can further contribute to the decision making regarding the social and socio- economic aspects of the project.

In the following chapters the methodology will be presented (Chapter 2) and implemented (Chapter 3). Then, in Chapter 4 the results of the research are presented and finally, proposals are made in Chapter 5, aiming at the amelioration of the project's process and outcomes.

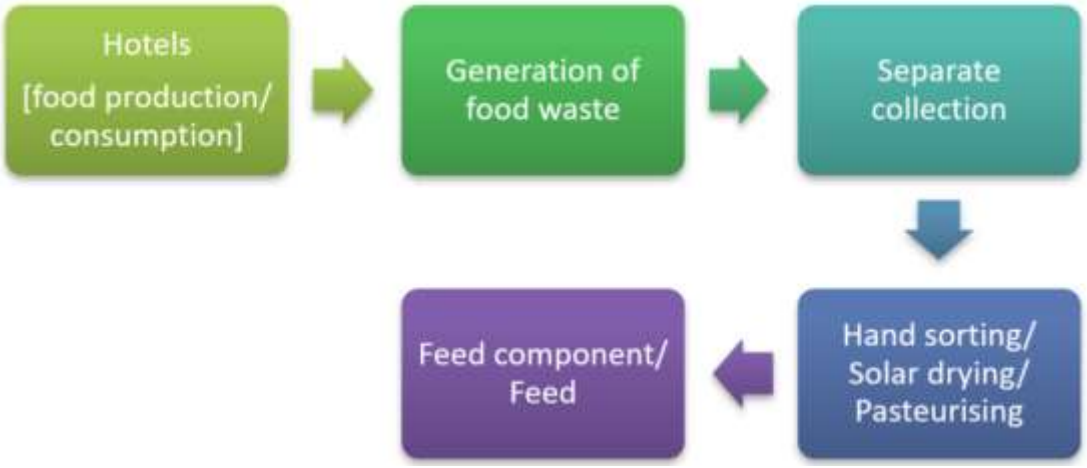

Figure 1. The project's process

Social Life Cycle Assessment

Introduction

The SLCA methodology, developed in the late '00s by UNEP/SETAC, can be considered as the complementary part of the Environmental Life Cycle Assessment (ELCA) as its goal is to identify and analyse the potential positive or negative social and socio-economic impacts of a product's (or service) life cycle, from the extraction of raw materials to manufacturing, distribution, use and disposal. The aspects studied in this methodology are situations or issues that affect the stakeholders involved to the product's (or service) life cycle. The reason to conduct such an assessment is to contribute to the decision making related to the product's life cycle, aiming at solving, or at least minimizing, the negative impacts. The framework of the assessment is simple but efficient; its main concepts are the stakeholders, the impact categories, the subcategories, and the indicators. According to the SLCA's Guidelines, for each stakeholder a set of impact categories and subcategories is defined and studied. Additionally, to assess the subcategories, inventory indicators are used. UNEP/SETAC proposes 5 categories of stakeholders that are involved in a product's (or service) life cycle.

These are:

i. Local Community
ii. Society
iii. Workers/Employees
iv. Consumers
v. Value chain actors (e.g., NGOs, public authorities etc)

Of course, it is possible to add more stakeholder categories in case it is needed. As it is evident, SLCA tries to study the impacts of a product's (or service) life cycle in different scales, meaning the local, the national and the international scale.

The methodology has been developed by UNEP/SETAC following the ISO14040, and thus, it consists of four phases goal and scope definition, inventory analysis and impact assessment. In the following sections, each of these phases will be presented.

Goal Definition

Defining the goal and the scope are the two first steps of the SLCA and the most important ones, as they establish the pathway followed for the assessment to be realized. More precisely, the goal defines what will be studied and why. Some of the questions that should be asked in this stage are *"why is this SLCA conducted? Who is it being done for or who will the audience be? How do they intend to use the results?".* However, probably the crucial question is *"are there any places, or processes in the production chain that have a negative social impact (or impacts that may be improved), if so, who are the victims, where in the chain does it occur and how might it be addressed?".*

Scope Definition

The scope aims at defining the most practical aspects of the assessment; thus, it describes the product and its limits, the part of the life cycle that will be assessed, the stakeholders involved, the categories and subcategories to include and the data needed for the realization of the study. Key features of the scope are the functional unit, meaning the function of the product studied, as well as the system's boundaries. Also, the type of information needed is defined so that the data collection will be realised in the next phase of the assessment.

Life Cycle Inventory Analysis

The second phase of the SLCA includes the collection and validation of the data and the identification of the hotspots. Regarding the data, they can be generic and/or site- specific. The generic data are useful as they can indicate quite early in the process the stages of the product's life cycle that are susceptible to negative impacts. However, SLCA is place- depended, as local laws, economy and culture determine a product's life cycle; therefore, it often highly recommended to collect site- specific data as well. Combining both generic and site- specific data leads to more reliable results that better represent the positive and negative impacts of the system assessed.

Life Cycle Impact Assessment

In this phase of the SLCA the data are aggregated and related to the defined categories and subcategories. Also, the analytical method that will be used is described.

Life Cycle Interpretation

The last phase of the SLCA refers to the interpretation of the results and to the description of the conclusions. Parts of this phase are the identification of the crucial issues, the evaluation of

the assessment, meaning recognizing the limitations, the level of engagement the stakeholders showed, as well as the proposal of specific recommendations that can potentially ameliorate the product's life cycle, but also the development of the assessment.

Implementation of SLCA on LIFE F4F

Goal and Scope

The goal of the assessment is to identify the potential socio- economic impacts of the European pilot program LIFE F4F. Hence, this assessment is conducted in order to locate and describe the potential weaknesses and strengths of the unit's recycling process. The recording and analysis of the potential impacts will contribute to the future decision making, given that the aim of this pilot project is to implement the recycling process to a larger scale. Hence, the outcomes of this assessment will be available to the partners responsible for this project, to the stakeholders involved, as well as to the civil society.

The scope of the study is to assess the life cycle of the project's process, emphasizing at the pilot-scale unit where the sorting and the solar drying takes place.

Functional Unit

The functional unit for this SLCA is the 3.000 tonnes feed component per year that the pilot-scale unit is expected to produce, according to the business plan. Thus, in this study, the socio-economic impacts arising from the production of 3.000 tonnes per year of feed through the recycling process of food waste collected from the hospitality sector are explored.

System Boundaries

The study follows the production process of feed from food waste collected from the collaborating 5- and 4-stars hotels located in Heraklion and Hersonissos, two highly touristic areas in the Prefecture of Heraklion, in Crete. This process is realized within the unit that has been designed and constructed for the pilot program in the vicinity of Nea Alikarnassos, also located in the Prefecture of Heraklion.

The process is developed in the following stages:

Stage 1

A refrigerated truck collects food waste from the collaborating 5 and 4- star hotels and disposes it at the unit.

Stage 2

The waste is positioned on a belt conveyor where the hand sorting is realized. During this stage all the liquids present in the waste are removed and thus, the final product is solid, hand sorted waste. The residual is transported to the nearby Waste Pre- processing Unit, after weighing it.

Stage 3

The solid waste is channelled to a funnel that leads it to a blender where a pulp is created.

Stage 4

A pump pushes the pulp to the drying cells, which are located in the greenhouse of the unit.

Stage 5

The organic pulp is deposited to an inox basin where it is stirred until its moisture is decreased up to 6 -10%.

Stage 6

The last stage includes emptying the cells and the storing of the final product into big bags before it is transported to the rest actors of the value chain.

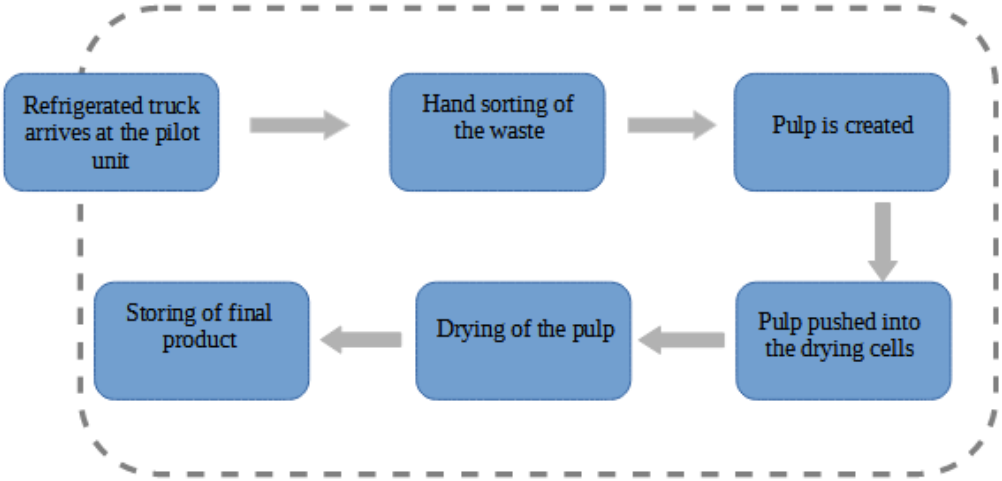

Figure 2. The system boundaries of this study

Stakeholder categories

The stakeholder categories that will be included in this study are the following:

Local Community

For the case of the F4F pilot program, the local community is considered to be the Prefecture of Heraklion in Crete, where the unit is located, as well as the collaborating hotels and the rest of the hospitality services.

Society

This stakeholder refers to the Greek society in a national level. Although the production system under investigation is realised in a pilot scale, it is also feasible to be realised as a potential process in regional or national level.

Workers

The workers studied in this assessment work in the different stages of the production system, including the drivers of the refrigerated tracks and the administration officers.

Consumers

The consumers that will be included in this study are the ones who receive the final product, meaning the feed. These are considered to be the stockbreeders located in the island of Crete, as well as pet owners of company animals, such as dogs and cats and also, the furry animals' growers and pet feed producers.

Value chain actors

The value chain actors include the hoteliers, the catering and the retailer that collaborate with this European pilot program and generally the hospitality sector.

Categories, SUBCATEGORIES, and Indicators

In this section, the categories, subcategories, and indicators for each stakeholder are presented. The determination of the categories, subcategories and indicators that are used in this assessment was based primarily on the Guidelines of the UNEP/SETAC, as well as on the specific

Table 1. The subcategories and indicators used for the stakeholder category "workers"

Workers (in the unit)		
Subcategory	**Indicator**	**Data type**
Working Conditions	Working hours (without transportation)	Quantitative
	Changes at the schedules	Quantitative
	Cost of transportation	Quantitative
	Time of transportation	Quantitative
Working Rights	Presence of contract	Qualitative
	Compliance with the contract agreement	Qualitative
	Compliance with agreed working hours	Qualitative
	Compliance with the agreed payment	Qualitative
	Freedom to associate	Qualitative
	Social benefits	Qualitative/ Quantitative
	Social security	Qualitative/ Quantitative
	% of each sex occupied in the unit	Quantitative
Health and	Provision of special equipment	Qualitative
	Info-session for the use of special equipment	Qualitative

Workers (in the unit)		
Security	Info- session for the probable danger	Qualitative
Satisfaction	Employment opportunities	Qualitative/ Quantitative
	Training	Qualitative/ Quantitative

Table 2. The subcategories and indicators used for the stakeholder category "local community" Local Community

Local Community		
Subcategory	**Indicator**	**Data type**
Transparency	Accessibility to the action	Qualitative
	Informative campaign before the launch of the action	Qualitative
Participation	Number of local stakeholders participating to the action	Quantitative
Trust	Trust towards the involved actors	Qualitative
Occupation	Number of new jobs for locals directly related to the action	Quantitative
	Number of new jobs for locals indirectly related to the action	Quantitative
Quality of life	New public constructions related to the action	Qualitative/ Quantitative
	Amelioration of the road network	Qualitative/ Quantitative
	Amelioration of the landscape	Qualitative
	Amelioration of public health	Qualitative/ Quantitative

Table 3. The subcategories and indicators used for the stakeholder category "society"

Society		
Subcategory	**Indicator**	**Data type**
Waste Management	Changes of the food waste quantities diverted from being illegally disposed	Quantitative
	Changes of the food waste quantities diverted from being buried	Quantitative
Employment	Total number of new job opportunities when implemented in a national level	Quantitative
Awareness	Organization of educational events raising awareness related to food waste	Qualitative
Governance and Policies	Agreement with EU policies regarding food waste	Qualitative/ Quantitative

Table 4. The subcategories and indicators used for the stakeholder category "consumer"

Consumers		
Subcategory	**Indicator**	**Data type**
Choice	Affordability	Quantitative
	Accessibility	Qualitative
	Labels	Qualitative
	Traceability	Qualitative
Satisfaction	Overall satisfaction	Qualitative
Health and Safety	Safety for humans and cattle	Qualitative/ Quantitative

Table 5. The subcategories and indicators used for the stakeholder category "hotels"

Hotels (Value Chain Actors)		
Subcategory	**Indicator**	**Data type**
Efficiency	Additional commercial profits for the company	Qualitative/ Quantitative
	Cost reduction of waste management	Qualitative/ Quantitative
	Additional non- commercial profits (i.e., subsidies)	Qualitative/ Quantitative
Expansion of hotels' target groups	Number of new clients due to the green practices	Qualitative/ Quantitative
Spill over effect	Adoption and implementation of green practices in another sector of the hotel's function	Qualitative/ Quantitative

Data collection

As it has been already underlined, SLCA is place- depended, meaning that the geographical component determines the outcomes of the assessment. For that reason, it is highly recommended to combine both generic and site- specific data, aiming for the best and most representative result. However, collecting site- specific data can be a challenging process, as multiple complications might arise. In the case of the F4F pilot program, the data used for the assessment are mainly generic data, extracted from international and national databases provided online by institutions and organizations such as the Hellenic Statistical Authority (ELSTAT) and the statistical office of Europe (EUROSTAT). For the stakeholder categories "workers" and "consumers", two different questionnaires were distributed to each group, aiming at understating the advantages and disadvantages of the production process and the final product, as well at exploring any limitations and other socio- economic issues related to the production process. Additionally, academic literature was used related to issues such as the production of feed from food waste and the function of food recycling centres. The conduction of an *in-situ* research was not possible due to several limitations, including the COVID- 19 pandemic that hindered part of the assessment. Besides the limitations imposed by COVID- 19, it is important to mention that some of the databases are not currently updated, hence there is an error in the numbers used, nevertheless, the overall outcomes are considered to be representative.

LIFE Cycle Inventory analysis

This section includes the data collection that relates to the characteristics of the study area, meaning the Prefecture of Heraklion, as well as to the unit and its function. Additionally, information related to the involved stakeholders are also presented.

Unit Location

The unit under study is located in Nea Alikarnassos, which is less than 5km far from the city centre of Heraklion. Based on information retrieved from the official website of the Iraklio Urban Buses, the access to the unit can be realized by urban bus lines of zone A, as for example bus number 7 that follows the itinerary Giofiro - Prassa – Amnissos. The price for one itinerary is 1,10€, while a monthly bus card costs 60,00€. Time wise, the itinerary does not take more than half an hour and the frequency of buses does not exceed 10 minutes.

Local Community

Crete is the largest island of Greece, and the Prefecture of Heraklion is one of the most populated areas of Greece. According to the census of 2011, the total population of Greece was 10.816.286 and the total population of Crete was 591.772, while in the Prefecture of Heraklion 304.000 people were counted[6]. Regarding local economy, the two most important economic sectors are agriculture and tourism. In the Prefecture of Heraklion there are 885 hotel units with more than 76.000 beds, while the number of visitors in 2018 exceeded 5000 (INSETE, 2020). The work force of this sector reached 38.855 in 2018. Agriculture is also a crucial sector for the Prefecture as it occupies 82.000 persons from the total of 166.688 employed persons based on data from 2016[8,9]. Especially for feed producers, data from 2011 show that the total number in the Prefecture of Heraklion was 624, which is less than the 1% of the total number of feed producers of Greece[10].

Workers

As it has been already mentioned, most of the employed persons in Crete are occupied in the sectors of tourism and agriculture, while unemployment was 17,3% in 2020. According to the Business Plan for a full-scale unit, 12 workers would have been hired in the following positions:

Table 6. Number of workers in the pilot unit by position

Position	Number of employees
Sorting	2
Drying	2
Pasteurizing	3
Packaging	2
Transportation (drivers)	2

Administration	1
Total	**12**

The annual cost for this number of employees is estimated to 156.672,00 euros.

Value Chain Actors: Hotels

The hotels participating in the action are presented in Table 7.

Table 7. Collaborating hotels and the generated quantity food waste

Hotel	Category	Number of beds	Daily quantity of food waste (kg)	Monthly quantity of food waste (kg)
Apollonia Beach Resort & Spa	5*	671	336	10.065
Aquila Atlantis Hotel	4*	291	115	3.450
Olive Green	4*	100	26	780
Creta Maris Beach Resort	5*	1078	539	16.170
Santa Marina Resort	4*	398	199	5.970
Galaxy Hotel	4*	234	59,5	1.785

Society

Greece is one of the old members of EU and it went through an economic and social crisis since 2010 that still affects many Greeks. According to recent data retrieved from ELSTAT, the unemployment rate is 13,9%, affecting mainly young people, while 28,9% of the total population is exposed to the risk of poverty. Greece is also an important producer of food waste. Based on a recent report from UN, Greece is the EU country with the highest food waste production, as it reaches the large amount of 142kg/inh/yr. Food waste has related to multiple environmental, but also socio- economic impacts; high production of GHG, land degradation, water shortages and a cost reaching up to $1trillion per year is the result of food waste and food loss (Ambeliotis, 2017).

Consumers

The consumers of this product are separated in two groups: the stockbreeders and the companion pet owners. Regarding stockbreeders, according to data from 2009, in the Prefecture of Heraklion there are in total 1.641 cattle, 453.093 sheep, 188.270 goats and 12.597 pigs. However, regarding owners of companion animals, there are not specific data for the area; besides that, it is a fact that Greece is facing a serious issue with stray cats and dogs, which are

often fed with animal feed by citizens, without being owned by someone. Therefore, it is not possible to define how many animals will be fed by the product or how many people will be interested in the product.

Life Cycle Impact Assessment

Impact categories, SUBCATEGORIES, and indicators

Local Community

a) Transparency

Information about the pilot LIFE F4F project, its evolution and the deliverables can be fully accessed by everyone on the website of the project. Hence, it is a fully transparent and accessible action to the locals and to every other citizen interested in this specific approach of waste management.

b) Participation

The participation to the pilot program is satisfying as the unit is still rather small and it would not have been possible to manage the food waste of every 5- and 4-star hotel of the area.

c) Trust

According to the Standard Eurobarometer 94 of winter 2020/2021, the majority of Greeks claims not to trust both the EU and the national government. Thus, there is a high chance that the civil society might not show the necessary trust to this pilot program, however, as it is a transparent project with specific outcomes these trust issues can be overcome through adequate informative sessions and awareness actions.

d) Awareness

The function of the unit has been covered by the local media, informing locals about the goal of the project and about the participation of the local stakeholders involved. However, the events that have taken place have been addressed mainly to the partners involved or to people/organizations related to waste management issues.

e) Job opportunities

As it has been mentioned, the pilot program has created 12 new job opportunities. Based on data from the INSETE (2019), there are in total 393 5-star and 4-star hotels in the island of Crete. In case this pilot program is implemented in the whole island, it is expected that approximately 1179 new jobs will be created.

Workers

The data used in this study to extract information related to the working conditions in the Solar Drying/Pasteurizing Unit have been retrieved by ELSTAT and EUROSTAT. EUROSTAT has developed 68 indicators on seven dimensions (Figure 3) exploring labour conditions as seen from the employees' perspective.

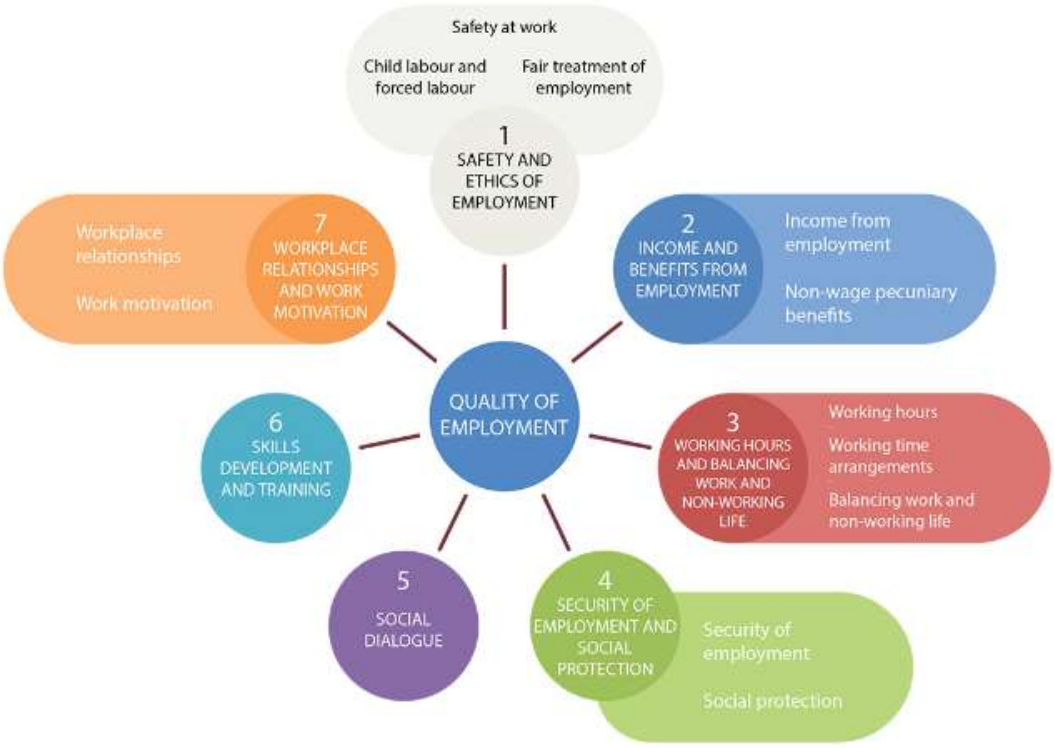

Figure 3. The dimensions of quality of employment according to EUROSTAT (2021)

More specifically, the dimensions covered by the EUROSTAT are Safety and Ethics of Employment, Income, and benefits from employment, Working time and work-life balance, Security of employment and social protection, social dialogue, skills development and training, Employment- related relationships and work motivation. Overall, these dimensions are in accordance with the impact categories proposed by the SLCA Guidelines.

In this assessment, four subcategories have been chosen for the stakeholder category "workers". In the following sector data will be provided for each subcategory and indicator, based on generic data collected from the databases.

Health and Safety

a) Accidents at work

The most recent data of EUROSTAT regarding fatal work accidents are from 2007, including the sectors of agriculture, electricity, gas and water supply, construction, retail trade, hotels and restaurants, manufacturing, real estate, vehicle reparation, transport, and business activities. According to this data, in 2007, 50 persons died because of an accident during work time. Data from ELSTAT are more recent (2019), showing that in the sector of food processing a total number of 65 persons had a work accident and only 2 of them took place in the island of Crete.

Discrimination at work

According to EUROSTAT's data from 2015, 9.8% of women in Greece have dealt with phenomena of discrimination at work, while the percentage of men experiencing such situations reaches 5.8%. The Gender Equality Index also shows the difference between men and women regarding work; according to data from 2019, only the 33% of women in Greece have a full-time job.

Training

Regarding the role of work to the personal development, the 51.4% of Greeks believes that their job does help them improve their skills, based on EUROSTAT data from 2015.Additionally, 56.1% of employed Greeks claims that they can use their knowledge and skills to their current job.

Working conditions

a) Transportation

The unit is located close to the city of Heraklion. If the workers of the unit live in the city, there are three scenarios hypothesised regarding the cost of transportation:

- Private Vehicle

  In case they use their own car to access the unit, the cost for their transportation depends on the oil/gas prices and the vehicle used. On average, the price for the unleaded gasoline in the Prefecture of Heraklion is 1,821€, which is among the most expensive in Greece.

- Urban Bus

  The urban bus line costs 1,10€ for each itinerary. Hence the cost for accessing work five times per week is 48,4€ per month. In case the worker has a monthly transportation card, then the cost reaches 60€ including the access to work.

- Company Bus

  In that scenario there is no cost for the people working in the unit as the transportation cost is covered by the company.

Something that must be considered regarding transportation to the unit is the fact that Crete has above average percentage of fatal car accidents (ELSTAT, 2021), hence, the risk of been transported to work by a private vehicle is higher than using a company or urban bus.

b) Security

All the employees of the unit are under contracts that include, of course, their health insurance, while they are regularly paid given the nature of the program.

c) Satisfaction

According to the Standard Eurobarometer 94 of winter 2020/2021, Greeks are overall satisfied with their job situation as the 90% of the participants in this research claim to feel "good" or "not bad".

Besides the aforementioned information, retrieved from the national and international databases, a questionnaire was distributed to the employees of the unit, covering the same subcategories through 31 questions, that also refer to the demographics of the sample.

The questionnaire was completed by the 8 employees, which worked in the F4F pilot unit at different periods of the implementation of the project.

According to the answers provided, the majority of the employees are men (6) and the dominant age group is from 25 to 29, with only one employee being at the age group of 30-44. One participant has completed the primary level of education, seven out of the 8 participants have completed the secondary education or/and have attended a vocational training. Two participants hold a university degree, while one also holds a master's degree. Most of the employees (5) work at the collection and the sorting of the waste, one is the driver of the refrigerated truck and two are responsible for the operation of the unit. The working experience of the staff in the field of waste management and process does not exceed 10 years, but one participant has been working in this field for 10 to 15 years. Only three employees claimed that they used to work in a different field before being hired in their current position.

Regarding working hours, 5 participants work foul time and 3 part time, meaning that they do not exceed the amount of 20 hours/week. Among the participants, 3 mentioned that they work often overtime, while the rest 5 rarely; nevertheless, all the employees claim that they consider the total amount of time they spend for work, including commuting, as normal.

In the subcategory "Health and Safety", the participants were asked about their exposure to pollutants. 50% of them claim to be exposed to pollutants during approximately half of their working time, three of them claim to never or almost never be exposed, while only one employee is exposed to pollutants during the whole working time. Despite that, all the employees agreed that special equipment is provided, with all of them being well (2) or very well (6) informed about health and safety issues related to their work at the unit. In the question "How often do accidents at work occur in your workplace?", the majority answered "never" and only one participant claimed that very rarely accidents do occur.

All of the employees that completed the questionnaire work under a fixed- term contract, and at the same time all of them agreed that the contract's agreements are respected, and social security is provided. More specifically, at the questions "Are the terms of the contracts respected?" and "Is social security provided?", all chose to answer "Yes". Also, the employees are apparently uninformed regarding their right to freedom of association and collective bargaining.

As it has been already mentioned, the unit is located close to the city of Heraklion, hence, the employees of the unit were asked about their commuting. All of them use a privately owned car to access the unit, while for half of the participants the transportation cost does not exceed the amount of €2,0. Overall, the cost of transportation does not seem to be more than €3,0 and all the participants are satisfied with it. According to them, the employers do not offer the option of company vehicle, nor any other type of benefit, such as a free lunch; however, 7 out of 8 participants state their satisfaction regarding the working conditions. Additionally, 75% of the participants claim that the income they receive covers all their needs and two participants also believe that his job has contributed to the amelioration of their life.

Value chain actors

Hospitality sector

As it has been already mentioned, several hotels are collaborating with the program; additionally, one catering service is also part of the pilot program, as well as several supermarkets.

During the past decades, it has become common for hotels to adopt green practices as an effort to prove their responsibility towards environmental issues, given that tourism and hospitality sectors have been related to environmental issues, while they are also highly influenced by environmental degradation (Wang, 2012). These practices vary, from water conservation to reducing energy consumption and improving waste management (Han et al. 2018; Merli et al. 2019). Thus, the action of collecting and managing food waste through the LIFE F4F pilot program can be considered as a green practice that promotes sustainability.

These change towards green practices can potentially help hotels financially in different ways. Reducing or better managing the consumption of resources has a financial impact on hotels, given that operational costs decrease. Besides that, research has shown that promoting sustainable solutions creates a green profile that is appreciated by costumers (Yixui et al. 2017). In fact, Merli et al. (2019) and Han et al (2018) proved that there is indeed a correlation between customers' satisfaction and green practices, while loyalty and revisit are also related to this environmental responsibility hotels show. This attitude might be enhanced in the case of the F4F as it is part of the collaboration contract to offer to hotel customers the option to visit the unit and observe the process.

Chan et al (2014) explored another positive outcome as they showed that the green practices implemented by hotels increases the environmental awareness and concern among employees, which further influences their behaviour toward such issues. Therefore, by choosing to participate to a pilot program like LIFE F4F, hotels create a spill- over effect regarding environmental sensitisation.

Society

As it has been already mentioned, Greece is the largest food waste producer of EU. The implementation of this project in a larger scale could change the landscape of waste production and management of Greece, given that it is a highly popular tourist destination with almost 400.000 beds been available in 5- and 4-star hotels every year. More specifically, according to INSETE (2019) there are 2108 5- and 4-star hotels in Greece. Based on the data collected by the implementation of the pilot program in Crete, it was extrapolated that the amount of waste nationally by these hotels reaches up to 16.122tn/moth (193.463 t/y). From this amount of food waste, almost 60.000 tonnes of feed can be produced annually, meaning that the 20% of the total food waste produced by the hospitality sector (Lazaridi et al, 2019) will be channelled into reuse instead of disposal. Hence, by implementing this project in a national level scale, Greece can start reaching the EU goals. Additionally, based on the needs of the pilot unit, it has been calculated that approximately 6.350 new jobs will be created.

Consumers

Regarding consumers, a questionnaire including 11 closed-ended questions (Table 8) was developed and distributed to potential consumers, aiming at exploring their views and opinions regarding this product. The questionnaire was completed by 246 consumers in total, from which the 16% owns a dog, the 14% a cat, while the majority (64%) does not own a pet. Also, almost all the participants follow a non- vegetarian/ non- vegan diet, meaning that they do consume meat and animal products such as milk and eggs.

Table 8 The questions asked to consumers regarding the production and use of the produced animal feed

Number	Question
1	How do you rate the use of food residues in animal nutrition?
2	Which animal species could you imagine receiving food residues as a component of animal feed?
3	How do you rate the use of food residues as a component of animal feed in the context of environmental protection?
4	Would you buy a commercial petfood, which includes food residues, for your dog/cat?
5	Would you buy meat or other products (e.g., eggs, milk products) from farms animals, which receive food residues as a component of animal feed?
6	Which type of food residues could you imagine to be a component of animal feed?
7	How do you rate the hygiene of animal feed which includes food residues?
8	At the moment, the food residues are exclusively collected in hotels.

	Could you imagine also other sources of supply?
9	Do you have a pet?
10	Do you eat meat or other animal- derived products?
11	Do you think that we waste too much food?

According to the answers given in this questionnaire, 42% of the participants find themselves sceptical towards the use of food residues in animal nutrition as they consider it either "risky" either "with pros and cons". Only a 32% is positive, characterising it as "without problems". There is also a relatively high percentage (27%) that expressed their ignorance about the issue, choosing the answer "I don't know".

Nevertheless, the majority (44%) believes that the most adequate animal to receive such a feed product is the pig, while 25% referred to cats and dogs and 15% to fur- bearing animals, which also includes the pets, reaching a total of 40%. Despite this, 41% would not buy such a petfood for their dog or cat, yet there is an indecisive 22%. Hence, only the 36% would for sure buy this product for their pets (Figure 4).

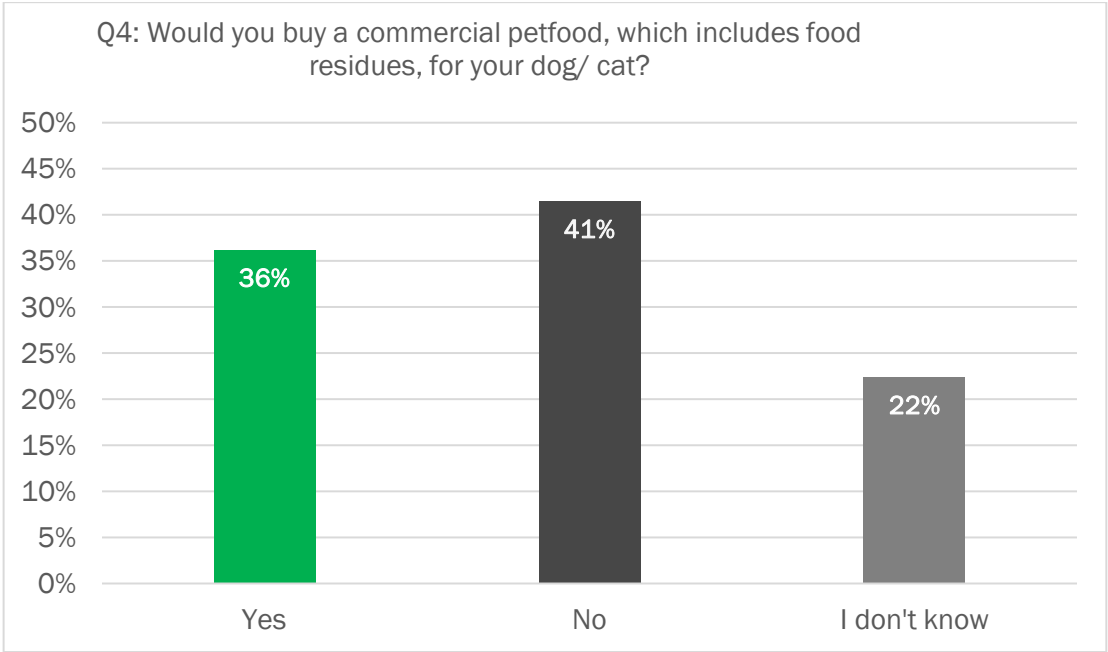

Figure 4. The percentage of participants that would buy the unit's product or a similar one

Probably this answer can be explained by the view people have on the hygiene of the feed that includes food waste; more specifically, 42% of the participants claim that the hygiene of the product seems "bad" or "risky", meaning that they find it dirty, or they just do not trust the safety of the product. Again, only the 32% considers it good, while the 27% answered "I don't know". However, when asked if they would buy meat or other products from farm animals that receive food residues as a component of animal feed, the larger part of the participants (67%) answered "yes", which indicates that they would buy products produced by animals that consume such feed. Regarding the food waste that is used as a component for the animal feed,

most participants 36% imagine to be bakery products, followed by 32% who believe fruits and vegetables are primarily used. Additionally, 18% chose the option "meat" and 14% thinks that the components are products such as noodles, rice and potatoes. When asked about the source of the food waste provided for the feed production, the participants think that supermarkets should also be a source (36%), followed by restaurants and cafes (28%), weekly market (25%) and bakeries (11%). Finally, at the question related to the amount of food waste we produce, 48% agreed that we waste too much food, the 29% disagreed by giving a "No" as an answer, while the 21% expressed their ignorance about this issue.

Animal growers and feed producers

Several semi-structured interviews were contacted with furry animals' growers, aiming at exploring their views and opinions regarding the product. The views of the furry animals' growers were especially positive for the use of the product, particularly in times of increased prices of feed, due to elevated energy and transportation costs. It was noted though that the use of the product was dependent almost solely from the actions of the feed production industry. They also noted that despite the extensive experiments with broilers, pigs, dogs and cats, no experiments were contacted with furry animals (not included in the proposal). This is something that it needs to be remedied in the future.

Despite any furry animals' growers and pet feed producers cost savings and the fact that more efficient conversion rates may be achievable as well as the fact that processed food waste (PFW) feed components are likely to be relatively cheaper (or even subsidised, meaning that production costs could be reduced), processed food residuals by the F4F process is more likely to have lower conversion ratios. Consequently, processed food residuals feeding will almost certainly require an additional feeding period (in fact, as suggested in Westeddorf (2000), up to 40-50 percent additional feeding period may be necessary) or lower substitution of feed. Consequently, producers who implement a processed feed residuals feeding regime are likely going to incur additional costs, some of which are actually incurred (using of infrastructure, additional labour, etc.) as well as significant opportunity costs (which can be considered as the cost of the sacrifice related to conventional feed). The first opportunity cost relates to the physical opportunity cost, or revenue foregone, associated with the inability to restock. This arises because there is an effective constraint on production output (in terms of numbers of livestock). This has obvious implications for enterprise gross margins (i.e., the gross income (before accounting for fixed costs) from a single unit of head for livestock). Alongside this, there will be financial opportunity costs of resources used in production, that is, the financial charges on capital tied up in buildings and equipment or implicitly incurred through the foregone interest on capital tied up in currently owned buildings (i.e., with livestock taking longer to rear, the buildings and other resources are tied up, preventing restocking, which represents an opportunity cost).

As alluded to above, there is a direct link between margins and the level of the opportunity costs. Other things being equal the higher the opportunity cost, the lower the resulting margins. It is important to also bear in mind that the net margin depends on the relative price of PFW products. The adoption of processed feed residuals is warranted especially when the price of processed feed residuals products is relatively cheap. However, even if feed derived from processed food residuals is fully subsidised (i.e., available to producers at zero cost) the use of these feed components are only desirable if the opportunity costs do not excessively increase the total cost. If the costs of processed feed residuals products are the same as conventional feed, then the enterprise will be less profitable compared to conventional feed, due to the almost certainly increased (physical and capital) opportunity costs - which stems from the inferior conversion ratios associated with processed feed residuals feed. The adoption of processed food residuals as feed is, therefore, also dependent on the extent of the magnitude of the costs.

The transportation costs (including the negative externalities such as unwanted noise and vibration) of food waste is a further factor requiring consideration. However, irrespective of whether the food waste is destined for landfill or feed component, as described in Spinelli and Corso (2000), there is likely to be no net increase in transportation costs. Therefore, the reasonable assumption was made that the transportation costs are the same under both options, meaning that, from a cost-benefit analysis perspective, it is not a relevant cost (i.e., the net difference will be the same whether it is included or not).

Life Cycle Interpretation

The last phase of the Social Life Cycle Assessment is about drawing conclusions regarding the studied product.

Firstly, regarding local community, it is expected that the unit will contribute to the amelioration of waste management, leading to the solution of environmental and socio-economic issues related to the illegal or ineffective waste disposal. This is a rather important step, given that Crete is the largest island of Greece, among the most populated islands that increases its population seasonally due to the tourist industry. This seasonal difference requires the presence of such units. Additionally, a new industry can also contribute to the economy of scale of the island. Especially when taking into account the plans for constructing a Circular Economy Park in Heraklion, something that can function not only as an effort to reduce waste, but also as an attraction for locals, tourists and scientists.

The work force of the area is also positively affected as the presence of the unit functions as a new job opportunity in a new sector characterized by technological innovation and ecological approach. Basically, it offers a new option to locals who are not involved in the most popular sectors, agriculture, and tourism. The construction of more units in the island can become the

reason for locals to develop new skills and even services or industries related to the unit's processes and products.

From the workers' perspective, as this was expressed through the answers to the questionnaire, working at the unit seems to be overall satisfactory. The majority of the employees are content with their salaries, the cost of transportation and the working conditions; however, there are some interesting observations. It is rather interesting the fact that the participants were not fully aware of their contracts' terms and the extent to which these terms are implemented and respected. Similarly, the lack of information regarding the right to freedom of association and collective bargaining is something that should be taken into account. Despite these issues, the function of this unit has contributed to the employment of young local people of an age group that is highly affected by unemployment, which is a rather promising outcome.

Regarding the hotels and the rest of the local companies collaborating with the project, it has become clear that the participation to the project has a positive impact on them in multiple ways. The most important aspect is the spill over effect such actions have not only towards the company itself, but also towards the rest of the society. By choosing to implement a green practice, these companies cultivate an ethical profile, that does attract a relatable target group of people. Additionally, citizens and employees who might not have any input about the importance of waste management, get informed and possibly develop a new environmental behaviour. The financial impacts are not expected to be as direct as it would be if a different practice had been adopted i.e., reducing energy consumption, however, by enlarging the pool of costumers and by building a relation based on loyalty, a positive financial impact is expected.

Animal growers and feed producers are likely that they may become increasingly attracted to seek to use food waste as feed as the price of conventional arable based animal feeds increase. An important factor is the feeding conversion rate (i.e., the ratio between the weight of food waste and weight gain) of the food waste. Producers will be willing to pay a significantly lower price for food waste that is of a low feeding value. Associated with this, the proportion of producers who will switch to food waste products is related to the relative price and feeding value. At very low feeding values, it is shown that very few producers will be better off using food waste unless it is subsidised.

Therefore, the link between opportunity costs (which can be considered as the loss associated with not using conventional feed, e.g., if nutritional value is low longer feeding periods may be required) and the use of food waste is explored. There are clear indications that the use of food waste as animal feed is only justified when the price of food waste products is relatively low. In fact, even if the food waste feed is fully subsidised (i.e., available to producers at zero cost) the use of these feed products is only profitable if the opportunity costs do not increase the total cost by more than around 10 per cent. If feed derived from food waste costs the same as

conventional feed, then the enterprise is shown to be less profitable, due to the opportunity costs.

Of course, the impact of the unit can affect Greek society in total in case it is realised as a project in a national or regional scale. The most important aspect is the reduction of food waste, a huge problem for Greek society, as it has been already mentioned. Food waste has been related to multiple environmental and socioeconomic impacts, which can be reduced through such an action.

Finally, the opinions and views of the consumers were investigated, revealing some important aspects that need to be managed for this pilot program to succeed, especially when applied in a larger scale. The main outcomes of the research on the consumers are that there is a rather large number of people who are not in a position of providing clear answers related to the production and use of the animal feed, as well as to the waste produced in general. In fact, almost in every question there was a stable percentage (20-30%) who chose the answer "I don't know".

This shows that there is a lack of knowledge regarding food waste and food waste recycling/ reuse. As a result, apparently the necessity for such products and processes is not clear to the consumers, while the trust to the product is quite limited as many of them would not buy it for their pets.

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ANNEXES

ANNEX 1. Ερωτηματολόγιο προς τους Εργαζομένους της πιλοτικής μονάδας F4F

Ερωτηματολόγιο προς τους Εργαζομένους της Μονάδας Επεξεργασίας Τροφικών Αποβλήτων

Τα στοιχεία που θα συλλεχθούν, θα χρησιμοποιηθούν στη μελέτη του Κοινωνικής Αξιολόγησης του Κύκλου Ζωής, η οποία πραγματοποιείται στο πλαίσιο υλοποίησης του Ευρωπαϊκού Έργου LIFE F4F (LIFE15 ENV/GR/000257).

Στόχος του έργου είναι η αξιοποίηση των τροφικών αποβλήτων του τομέα της φιλοξενίας μέσω της παραγωγής ζωοτροφής. Για περισσότερες πληροφορίες σχετικά με το έργο μπορείτε να επισκεφθείτε την ιστοσελίδα του έργου https://life-f4f.gr/.

Για την εξαγωγή ορθών εκτιμήσεων και ασφαλών συμπερασμάτων, είναι σημαντικό να απαντηθούν όλες οι ερωτήσεις με όσο το δυνατόν μεγαλύτερη ακρίβεια.

Όλες οι πληροφορίες και τα στοιχεία είναι αυστηρά εμπιστευτικά και συγκεντρώνονται και αναλύονται σύμφωνα με τον Γενικό Κανονισμό Προστασίας Δεδομένων.

ΘΕΜΑ: ΠΕΡΙΓΡΑΦΙΚΑ ΣΤΑΤΙΣΤΙΚΑ ΣΤΟΙΧΕΙΑ

1. Φύλο
   Γυναίκα
   Άντρας
   Άλλο

2. Ηλικία
   <20
   20 - 24
   25 - 29
   30 - 44
   45 - 64
   65<

3. Εκπαίδευση
   Πρωτοβάθμια
   Δευτεροβάθμια – Επαγγελματική Εκπαίδευση
   Τριτοβάθμια
   Μεταπτυχιακός τίτλος
   Διδακτορικός Τίτλος

4. Θέση εργασίας στη Μονάδα Ηλιακής Ξήρανσης [Συμπλήρωση κενού]

   ……..

5. Εργασιακή εμπειρία στον ίδιο τομέα
   < 5 χρόνια
   5 -10 χρόνια
   10 - 15 χρόνια
   >15 χρόνια

6. Πριν προσληφθείτε για τη συγκεκριμένη θέση εργασίας:
   Είχατε κάρτα ανεργίας
   Εργαζόσασταν σε ανάλογη θέση σε άλλη εταιρεία
   Εργαζόσασταν σε διαφορετικό αντικείμενο

ΘΕΜΑ: ΩΡΕΣ ΕΡΓΑΣΙΑΣ

1. Πόσες ώρες εργάζεστε την εβδομάδα;
   Πλήρες ωράριο
   Μερική απασχόληση

Αν απαντήσετε «**Μερική Απασχόληση**», σημειώστε τον αριθμό ωρών εργασίας ανά εβδομάδα.……

2. Πόσο συχνά δουλεύετε υπερωρίες;
   Ποτέ
   Σπάνια
   Συχνά
   Πολύ συχνά

3. Το σύνολο των ωρών που απαιτούνται μέσα στην ημέρα για την εργασία μου (ώρες δουλειάς + χρόνος μετακίνησης) είναι:
   Πολύ λίγες
   Λίγες
   Κανονικές
   Πολλές
   Πάρα πολλές

ΘΕΜΑ: ΥΓΙΕΙΝΗ ΚΑΙ ΑΣΦΑΛΕΙΑ (ΣΤΗΝ ΕΡΓΑΣΙΑ)

1. Στην εργασία σας πιστεύετε ότι εκτίθεστε σε διάφορες μορφές ρύπων;
   Ποτέ
   Σχεδόν ποτέ
   Περίπου στη μισή διάρκεια
   Σχεδόν καθ' όλη τη διάρκεια
   Καθ' όλη τη διάρκεια

2. Παρέχεται ειδικός εξοπλισμός ατομικής προστασίας όποτε χρειάζεται;
   Ναι
   Όχι

3. Χρησιμοποιείτε τον εξοπλισμό όταν απαιτείται;
   Ποτέ
   Μερικές φορές
   Σχεδόν πάντα
   Πάντα

4. Πόσο καλά πληροφορημένος/η θα λέγατε ότι είστε όσον αφορά τους κινδύνους και τα θέματα ασφαλείας στον χώρο εργασίας σας;
   Καθόλου πληροφορημένος
   Όχι πολύ καλά πληροφορημένος
   Καλά πληροφορημένος
   Πολύ καλά πληροφορημένος

5. Έχουν συμβεί εργατικά ατυχήματα στον χώρο εργασίας σας;
   Ναι
   Όχι
   Δεν γνωρίζω

6. Πόσο συχνά συμβαίνουν εργατικά ατυχήματα στον χώρο εργασίας σας;
   Ποτέ
   Πολύ σπάνια
   Σπάνια
   Συχνά
   Πολύ συχνά
   Δεν γνωρίζω

ΘΕΜΑ: ΕΡΑΣΙΑΚΑ ΔΙΚΑΙΩΜΑΤΑ

1. Τι είδους σύμβαση έχετε;
   Αορίστου χρόνου
   Ορισμένου χρόνου
   Προσωρινή σύμβαση
   Σύστημα μαθητείας
   Καμία σύμβαση
   Δεν Απαντώ

2. Υπάρχει η δυνατότητα δημιουργίας σωματείου?
   Ναι
   Όχι
   Δεν γνωρίζω

3. Γίνονται προσλήψεις από κοινωνικά ευπαθείς ομάδες;
   Ναι
   Όχι
   Δεν γνωρίζω

4. Τηρούνται οι όροι των συμβάσεων;
   Ναι
   Όχι
   Δεν γνωρίζω

5. Παρέχεται κοινωνική ασφάλιση;
   Ναι
   Όχι
   Δεν γνωρίζω

ΘΕΜΑ: ΠΑΡΟΧΕΣ/ ΣΥΝΘΗΚΕΣ

1. Ποιο είναι το κύριο μέσο μετακίνησης που χρησιμοποιείται για τη μετακίνησή σας προς και από τον χώρο εργασίας σας;
   ΙΧ
   Λεωφορείο
   Άλλο [Συμπληρώστε] ……

2. Ποιο είναι το κόστος που απαιτείται για την μετακίνησή σας από και προς τον χώρο εργασίας σας; [Συμπλήρωση κενού] ,,,,,,,,,,,,,,,,,,,,,,,,,,,,

3. Είστε ικανοποιημένος/η με το κόστος μετακίνησης;
   Καθόλου ικανοποιημένος/η
   Όχι πολύ ικανοποιημένος/η
   Ικανοποιημένος/η
   Πολύ ικανοποιημένος/η

4. Προσφέρονται επιπλέον παροχές από τον εργοδότη σας;
   Ναι
   Όχι

5. Αν ναι, οι παροχές που προσφέρονται είναι

Δωρεάν μετακίνηση προς την εργασία
Δωρεάν σίτιση
Άλλο [Συμπληρώστε] ……..…

6. Είστε ικανοποιημένος/η με τις συνθήκες στον χώρο εργασίας σας
   Καθόλου ικανοποιημένος/η
   Όχι πολύ ικανοποιημένος/η
   Ικανοποιημένος/η
   Πολύ ικανοποιημένος/η

ΘΕΜΑ: ΚΑΘΗΜΕΡΙΝΗ ΖΩΗ/ ΠΡΟΣΩΠΙΚΗ ΙΚΑΝΟΠΟΙΗΣΗ

Παρακαλώ συμπληρώστε τον παρακάτω πίνακα

1 = Διαφωνώ απόλυτα
2 = Διαφωνώ
3 = Είμαι ουδέτερος/η
4 = Συμφωνώ
5 = Συμφωνώ απόλυτα

	1	2	3	4	5
Το εισόδημά μου ικανοποιεί τις ανάγκες μου					
Με τη δουλειά αυτή έχει βελτιωθεί το επίπεδο ζωής μου					
Με τη δουλειά αυτή νιώθω ότι συμβάλλω στην κοινωνία/ νιώθω ηθική ικανοποίηση					
Πιστεύω πως αυτή η δουλειά θα συμβάλλει στην επαγγελματική μου σταδιοδρομία					
Η δουλειά αυτή με έχει κάνει να αλλάξω τις συνήθειες μου όσον αφορά την διαχείριση των αποβλήτων που παράγω ο ίδιος					

ANNEX 2. Ερωτηματολόγια Διαγνωστικής Έρευνας - Καταναλωτές

LIFE15 ENV/GR/000257
LIFE-F4F (Food for Feed)

Το ερωτηματολόγιο που ακολουθεί, εκπονήθηκε στο πλαίσιο του ευρωπαϊκού προγράμματος LIFE: «Food for Feed: An Innovative Process for Transforming Hotels' Food Wastes into Animal Feed». (Καινοτόμος Διεργασία για τη Μετατροπή των Ξενοδοχειακών Αποβλήτων Τροφών σε Ζωοτροφή, LIFE-F4F).
Στο πρόγραμμα αυτό συμμετέχουν ο Ενιαίος Σύνδεσμος Διαχείρισης Απορριμμάτων Κρήτης (Ε.Σ.Δ.Α.Κ.), το Γεωπονικό Πανεπιστήμιο Αθηνών, το Χαροκόπειο Πανεπιστήμιο, το Freie Universität Berlin (Ελεύθερο Πανεπιστήμιο του Βερολίνου) και το Τεχνολογικό Εκπαιδευτικό Ίδρυμα (ΤΕΙ) Κρήτης (σήμερα, Ελληνικό Μεσογειακό Πανεπιστήμιο).
Το έργο (project) **Food4feed,** που χρηματοδοτείται από την Ευρωπαϊκή Ένωση (LIFE15 ENV/GR/000257), έχει ως κύριο στόχο την αξιοποίηση υπολειμμάτων τροφίμων από καταστήματα μαζικής εστίασης (ξενοδοχεία, εστιατόρια) για παραγωγή ζωοτροφής που προορίζεται για διατροφή ζώων συντροφιάς (σκύλοι, γάτες), γουνοφόρων και ενδεχομένως παραγωγικών μονογαστρικών (χοίροι, πτηνά) στο μέλλον.
Το έργο υλοποιείται στην Κρήτη, όπου συλλέγονται τα υπολείμματα τροφίμων (λαχανικά, φρούτα, ζυμαρικά, ψωμιά, γλυκά, τυριά, λίπη, έλαια, κρέατα) από κάποιες μεγάλες ξενοδοχειακές μονάδες και μεταφέρονται στις εγκαταστάσεις του έργου για διαλογή, έλεγχο (ως προς τη σύνθεση, χημική σύσταση, μικροβιακό φορτίο, μυκοτοξίνες, αντιδιαιτητικούς παράγοντες κ.ά.) και ξήρανση σε ειδική κατασκευή με αξιοποίηση της ηλιακής ενέργειας (φωτοβολταϊκά).
Το υλικό (προϊόν) που προκύπτει είναι πλούσιο σε πρωτεΐνες και λιπαρές ουσίες (περί το 22% και 24% σε ξηρή βάση αντίστοιχα) και είναι απόλυτα ασφαλές για διατροφή συγκεκριμένων ειδών ζώων σύμφωνα με την ισχύουσα νομοθεσία.
Γενικότερα, τα υπολείμματα αυτά ανέρχονται σε χιλιάδες τόνους και αποτελούν άριστη πηγή ενέργειας, πρωτεϊνών και λοιπών θρεπτικών συστατικών για διατροφή των ζώων. Με το έργο αυτό, στα πλαίσια της κυκλικής οικονομίας, θα αξιοποιηθούν με ασφάλεια και θα περιοριστεί η επιβάρυνση του περιβάλλοντος που γίνεται με την απόρριψή τους.
Στο πλαίσιο ολοκλήρωσης του έργου θα ενδιαφερόμασταν για την γνώμη των πολιτών (καταναλωτών, σχετικών επαγγελματιών και επιχειρηματιών κ.ά.) όσον αφορά στην ιδέα και στον στόχο του έργου. Παρακαλούμε λοιπόν όπως διαθέσετε λίγο από τον χρόνο σας για τη συμπλήρωση του ακόλουθου ερωτηματολογίου.

Η ερευνητική ομάδα του **Food4feed**

Το έργο F4F (https://life-f4f.gr/en/**) που χρηματοδοτείται από την Ευρωπαϊκή ένωση έχει στόχο να αξιολογήσει αν τα υπολείμματα τροφών από ξενοδοχεία μπορούν να αποτελέσουν συστατικό ζωοτροφών (σε ποσοστό συμμετοχής 5-15%).**
Θα θέλαμε να ξέρουμε τη γνώμη σας για την ιδέα και το στόχο του έργου. Για το λόγο αυτό δημιουργήσαμε το παρακάτω σύντομο ερωτηματολόγιο, εκτιμώντας ιδιαίτερα τη συμμετοχή σας στην απάντησή του *(παρακαλούμε απλώς κάντε αριστερό κλικ στο ανάλογο κουτάκι, η αναίρεση γίνεται με τον ίδιο τρόπο)***.**

1) Πως βαθμολογείτε τη χρησιμοποίηση των υπολειμμάτων τροφών στη διατροφή των ζώων?

☐χωρίς προβλήματα ☐επικίνδυνη ☐έχει θετικά και αρνητικά
☐δε γνωρίζω

2) Ποια είδη ζώων φαντάζεστε ότι θα μπορούσαν να καταναλώσουν τροφή στην οποία έχουν χρησιμοποιηθεί υπολείμματα τροφών από ξενοδοχεία?
Μπορείτε να δώσετε περισσότερες της μίας απαντήσεις
☐γάτες και σκύλοι ☐χοίροι ☐γουνοφόρα ζώα ☐πτηνά

3) Πως βαθμολογείτε τη χρησιμοποίηση των υπολειμμάτων τροφών των ξενοδοχείων στα σιτηρέσια των ζώων λαμβάνοντας υπόψη την προστασία του περιβάλλοντος?
☐σημαντική ☐ άσχετη ☐ μέτρια ☐ δεν γνωρίζω

4) Θα αγοράζατε μια εμπορική τροφή για κατοικίδια συντροφιάς (γάτες- σκύλους) που περιέχει υπολείμματα τροφών για το κατοικίδιο σας?
☐ναι ☐ όχι ☐ δεν γνωρίζω

5) Θα αγοράζατε προϊόντα ζωικής προέλευσης (π.χ. κρέας, αυγά, γαλακτοκομικά) από μια κτηνοτροφική μονάδα στην οποία τα ζώα διατρέφονται με σιτηρέσιο στο οποίο συμμετέχουν υπολείμματα τροφών ξενοδοχείων?
☐ναι ☐όχι ☐δεν γνωρίζω

6) Ποιο είδος υπολειμμάτων φαντάζεστε ότι θα μπορούσε να χρησιμοποιηθεί στα σιτηρέσια των ζώων?
Μπορείτε να δώσετε περισσότερες της μίας απαντήσεις
☐φρούτα και λαχανικά ☐κρέας ☐ζυμαρικά, πατάτες, ρύζι
☐ψωμιά, μπισκότα

7) Πως βαθμολογείτε την υγιεινή των ζωοτροφών που περιέχουν υπολείμματα τροφών ξενοδοχείων?
☐καλή ☐κακή ☐επικίνδυνη ☐δεν γνωρίζω

8) Προς το παρών συλλέγονται υπολείμματα τροφών αποκλειστικά μόνο από ξενοδοχεία. Μπορείτε να φανταστείτε και άλλες πηγές τέτοιων υπολειμμάτων?
Μπορείτε να δώσετε περισσότερες της μιας απαντήσεις
☐εστιατόρια, ταβέρνες, καφέ ☐φούρνοι ☐λαϊκές αγορές
☐supermarkets

9) Έχετε κατοικίδια ζώα?
Μπορείτε να δώσετε περισσότερες της μίας απαντήσεις

☐σκύλο ☐γάτα ☐άλλα ☐όχι

10) Έχετε εσείς ή η οικογένεια σας κτηνοτροφική μονάδα?
Μπορείτε να δώσετε περισσότερες της μιας απαντήσεις
☐πτηνά ☐χοίρους ☐ γουνοφόρα ζώα ☐όχι

11) Καταναλώνετε ζωικής προέλευσης κτηνοτροφικά προϊόντα (κρέας, αυγά, γαλακτοκομικά)?
☐ ναι ☐ όχι (vegan) ☐ μερικά (vegetarian)

12) Πιστεύεται ότι σπαταλάμε πολλά τρόφιμα?
☐ ναι ☐ όχι ☐ δεν γνωρίζω

13) Θα αποφασίζατε να χρησιμοποιήσετε τα υπολείμματα τροφής των ξενοδοχείων ως συστατικό τροφής για κατοικίδια ζώα (γάτες-σκύλους)? (Μόνο για βιομηχανίες παραγωγής pet food).
☐ ναι ☐ όχι ☐ δεν γνωρίζω

14) Θα αποφασίζατε να χρησιμοποιήσετε τα υπολείμματα τροφής των ξενοδοχείων ως συστατικό ζωοτροφών για παραγωγικά ζώα (π.χ. χοίρους -πτηνά)? (Μόνο για βιομηχανίες ζωοτροφών).
☐ ναι ☐ όχι ☐ δεν γνωρίζω