BREADCRUMB

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DELIVERABLE 6.3

Data Management Plan - 2

Project title	BRinging Evidence-bAseD food Chain solutions to prevent and RedUce food waste related to Marketing standards, and deliver climate and circularity co Benefits		
Project acronym	BREADCRUMB		
Call topic	HORIZON-CL6-2023-FARM2FORK-01		
Type of action	HORIZON-RIA		
Coordinator	EIGEN VERMOGEN VAN HET INSTITUUT VOOR LANDBOUW- EN VISSERIJONDERZOEK - EV ILVO		
Project number	101136701		
Project start date	01/01/2024	Duration	36 months
URL	https://www.breadcrumb-project.eu/		

D6.3 – DATA MANAGEMENT PLAN - 2

Due date	**30/06/2024**	**Delivery date**	**27/06/2024**
Work package	WP6		
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VERSION AND AMENDMENTS HISTORY

Version	Date (DD/ MM/ YYYY)	Created /Amended by	Changes
0.1	08/04/2025	Sofie De Man	First draft
0.2	23/06/2025	Sofie De Man	Implementing remarks
1.0	23/06/2025	Capwell Forbang Echo	Checking for styling and getting report ready for submission

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Glossary of terms and acronyms used

Acronym/Term	Description
ABM	Agent-Based Model
AI	Artificial Intelligence
CC0	Creative Commons no rights reserved
CC BY	Creative Commons Attribution License
CERN	Conseil Européen pour la Recherche Nucléaire
ComESSH	Commission for Ethics in Social Science and Humanities
CS	Case Study
CSV	Comma-separated values
D	Deliverable
DDMMYYYY	Day and Month in 2 numbers, Year in 4 numbers e.g. 31042024
DM	Data Management
DMP	Data Management Plan
DMT	Data Management Team
Docx	Microsoft Word text document
DOI	Digital Object Identifier
DPS	Data Protection Steward
EU	European Union
FAIR	Findable, Accessible, Interoperable, and Reusable
FLW	Food Loss & Waste
FW	Food Waste
GDPR	General Data Protection Regulation
GIT	Global Information Tracker
HE	Horizon Europe
IP1, 2, 3, …	Impact Pathway 1
ISO	International Standards Organisation

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JRC	Joined Research Center
M	Month
MS	Member States
IDI	In-depth Interviews
FGI	Focus Group Interview
MOA	Motivation, Opportunity, Ability
MP3, MP4	Motion Pictures Expert Group Audio Layer 3, 4
MS	Microsoft
O1	Objective 1
OEI	Other Ethics Issues
ORD	Office of Research and Development
PID	Personal Identifiable Data
R1, 2, 3, …	Result 1
R&I	Research & Innovation
RAR	Roshal Archive format
SSL/TLS	Secure Sockets Layer/Transport Layer Security
TXT	Text
USB	Universal Serial Bus
WP	Work Package
T	Task
ZIP	Compressed file
TCB	Technical Coordination Board
SEN	Sensitive
PU	Public

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EXECUTIVE SUMMARY

The Data Management Plan – 2 is the second in a series of three planned reports that outlines the evolving data practices and current status of the BREADCRUMB project. Building on the foundational strategies set in the initial plan, this update focuses on the implementation progress of the FAIR principles, the operationalization of data workflows, and adjustments made in response to practical and ethical challenges encountered during the project's execution.

This report reflects the active phase of data management, where theoretical frameworks are translated into daily practice. Key developments include the refinement of metadata standards, enhancement of data accessibility mechanisms, and the establishment of repositories for both open and restricted data. As the project progresses, an emphasis is placed on maintaining interoperability and reusability through structured documentation and adherence to evolving standards.

This deliverable provides an updated overview, newly involved data stewards, and timelines for data preservation efforts. Lessons learned from the initial implementation phase have informed a more agile and responsive approach to managing human and technical resources.

From a security standpoint, the report highlights the deployment of secure storage infrastructures, access control mechanisms, and ongoing risk assessments to ensure the integrity and confidentiality of sensitive datasets. These efforts align with best practices and are continuously reviewed to meet legal and institutional requirements.

Ethical oversight remains a cornerstone of the BREADCRUMB project. In this phase, particular attention is given to data handling procedures involving personal or sensitive information, with reinforced measures for informed consent and data anonymization being introduced.

In summary, Data Management Plan – 2 illustrates the project’s continued commitment to FAIR data stewardship, responsible resource management, and ethical compliance. This mid-term review not only captures the progress made but also identifies areas for further refinement, ensuring that the BREADCRUMB project remains aligned with its overarching goal of producing impactful, transparent, and ethically sound research outcomes.

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1 INTRODUCTION

1.1 Main aims of BREADCRUMB

BREADCRUMB aims to provide an empirical evidence-based understanding of the purpose and nature of food marketing standards and their impact on food waste (FW) generation, to propose interventions that balance the objectives of reducing FW and other objectives of standards, and to help food chain actors increase the business potential of suboptimal foods. To achieve its aim, the project will pursue five detailed objectives.

- ✓ To establish a holistic view of the existing food marketing standards in the EU and their interrelations, by placing special emphasis on the least documented ones, i.e.: (i) private standards, and (ii) standards adopted at the level of specific Member States. Moreover, to identify the marketing standards which are most relevant to FW generation
- ✓ To create an empirical evidence base, by fusing existing and project-generated data, to provide estimates of the FW generated due to marketing standards in the supply chains of five targeted food commodities (fruits & vegetables, meat, eggs, cereals, fish).
- ✓ To understand and model: (i) the underlying mechanisms through which, marketing standards lead to FW generation, and (ii) the trade-offs between the objective of FW reduction and other objectives pursued by marketing standards. To structure and validate solutions (re-balancing) that alleviate the negative impacts of marketing standards to FW, while balancing the trade-offs with their other objectives.
- ✓ To improve market access and business potential of foods that do not meet marketing standards but are still safe to eat (suboptimal foods), by: (i) guiding food businesses in selecting appropriate marketing channels and business models, and assisting them in quantifying their business value; (ii) fostering change in consumers' and businesses' attitudes towards sub-optimal foods, through nudging marketing cues.
- ✓ To effectively manage the upscaling of the project results by: (i) developing operational guidelines and policy recommendations on how to prevent/reduce FW due to marketing standards, and thereby contributing to environmental sustainability and circularity of the food system; (ii) formulating a Code of Conduct balancing commercial and social value from suboptimal foods, and thereby contributing to economic sustainability and food poverty reduction; (iii) developing a strategy for the exploitation of key project results by the project partners (individually and jointly); (iv) undertaking appropriate dissemination and communication actions to maximise the project's impact; (v) establishing formal agreements with relevant projects to achieve impact synergies.

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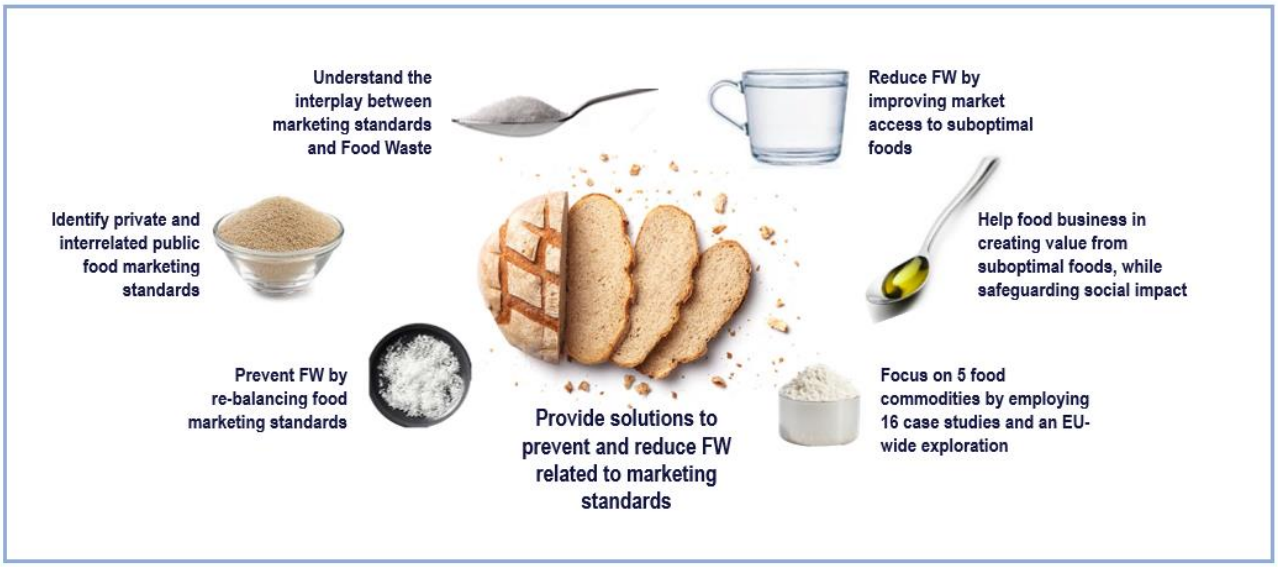

Figure 1: BREADCRUMB at a glance

These objectives are linked to (i) specific results serving as measurable indicators of achievement, (ii) means of verification, (iii) target groups to benefit from the project results, and (iv) the results' pertinence to the work programme.

BREADCRUMB will address five food commodities, through 16 multi-actor Case Studies to:

- ✓ provide information on private and Member State marketing standards
- ✓ provide estimates of FW caused by marketing standards
- ✓ provide insight on the trade-offs between FW reduction and other objectives
- ✓ support the development of the agent-based and economic models and validate their results
- ✓ co-create recommendations on preventing FW due to marketing standards and to enhance market access to suboptimal foods.

BREADCRUMB will employ a multi-actor approach that ensures the active involvement of a targeted diversity of actors, including food businesses, R&I organisations, civil society organisations, sectorial associations, and consumers. Therefore, it brings together the end users of the project results with R&I intermediaries who can contribute the required knowledge to effectively address the topic's objectives, in a co-creation process**.**

BREADCRUMB will develop an Agent-Based Model (ABM) to describe the impact of marketing standards on FW generation in imperfect competition markets. These markets are generally characterised by the presence of few large-quantity buyers and a high number of suppliers (oligopoly-like), and products of a similar base can be differentiated from each other through various means (e.g. appealing packaging or association with a brand name perceived as high quality). That type of markets suits the food sector well, and will be represented by BREADCRUMB case studies, serving as crucial information sources.

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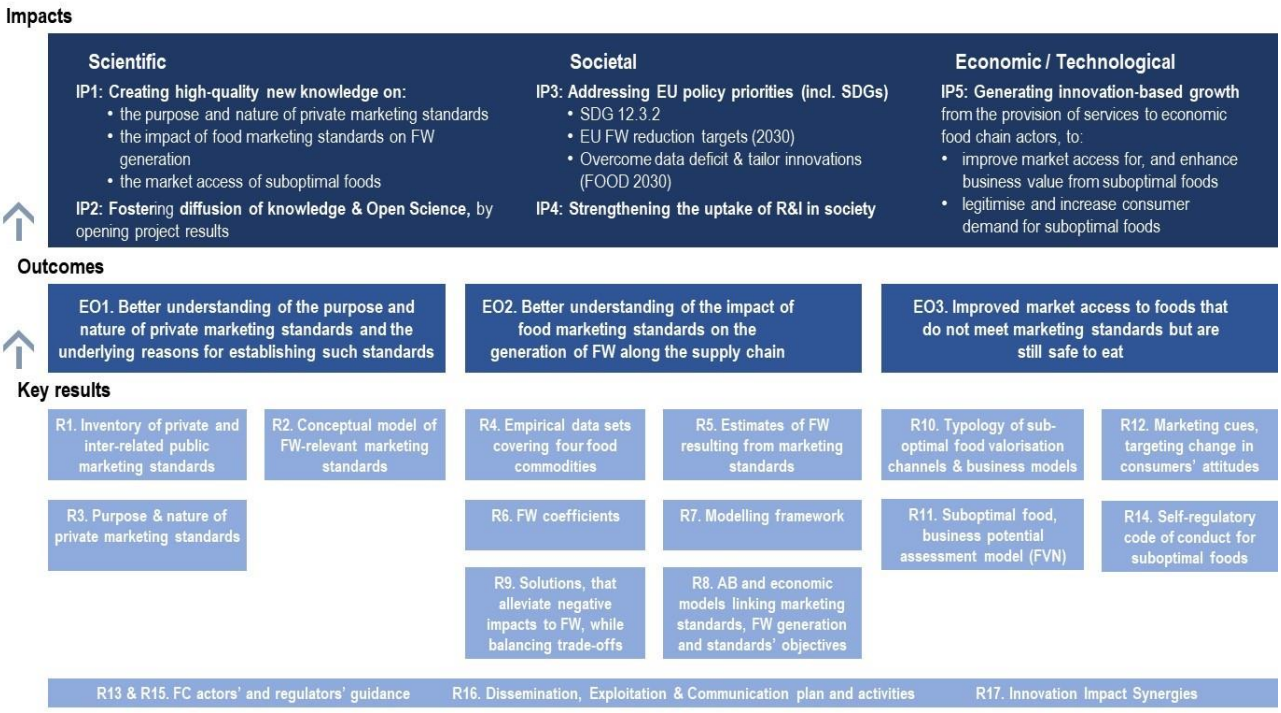

Figure 2: Overview of BREADCRUMB impact pathways

The objectives of BREADCRUMB will be pursued by the consortium through the implementation of a work plan consisting of six Work Packages (WPs) (Figure 2) for three years (36 months). These WP's have different goals, tasks and deliverables. This document supports these objectives by outlying a Data Management Plan that describes the principles and procedures compliant with EU rules and regulations, which the project should employ to manage data generated and/or collected (e.g. re-used) throughout the project duration.

1.2 From BREADCRUMB outputs to impact

BREADCRUMB will deliver 3 kinds of outputs aiming for different kinds of impacts (Figure 2).

- ✓ New high-quality knowledge will be created on (IP1)
  - The purpose and nature of private marketing standards
  - The impact of food marketing standards on FW generation
  - The market access of suboptimal foods

  Moreover, by opening project results, the diffusion of knowledge and open science is fostered by BREADCRUMB (IP2).
- ✓ The EU policy priorities will be addressed. This includes SDG 12.3.2, EU FW reduction targets (2030) and overcame the data deficit and tailor innovations (FOOD 2030) (IP3). This in order for a better understanding of the impact of the food marketing standards, but also to improve market access toe foods that do not meet marketing standards but are still safe to eat.

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- ✓ To further improve the market access and reduce FW, the strengthening of the update of R&I in society will be promoted in addition to enhancing the business value from suboptimal foods and increasing consumer demands for the latter (IP4 and IP5).

1.3 Data Management in BREADCRUMB

The Data Manager (DM) will be the coordinator, EV-ILVO, however each project partner will also appoint a Data Protection Steward (DPS) in their respective organization (see Table 1). All these people form the Data Management Team (DMT) of the BREADCRUMB project.

Table 1: List of designated Data Protection Stewards (DPSs)

Partner entity/ Organisation	Surname	First name	E-mail
EV-ILVO	Echo	Capwell	capwellforbang.echo@ilvo.vlaanderen.be
VLTN	Latinopoulos	Charis	charis.latinopoulos@vltn.be
UNIBO	Vittuari	Matteo	matteo.vittuari@unibo.it
	Masotti	Matteo	matteo.masotti8@unibo.it
UCPH	Rana	Subash	sr@ign.ku.dk
ITC	Miran	Bunderla	miran.bunderla@itc-cluster.com
CREDA	José Maria	Gil	chema.gil@upc.edu
	Djamel	Rahmani	djamel.rahmani@upc.edu
AINIA	Rocher	Mario	mrocher@ainia.es
CSCP	Fernandez	Regina	regina.fernandez@cscp.org
MC	Silva	Marlos	mhsilva@mc.pt
MCH	Silva	Marlos	mhsilva@mc.pt
AVEC	Khaldoune	Nadia	nk@avec-poultry.eu
VN	Slavic	Marko	marko@vila-natura.si
ZT	Miran	Bunderla	miran.bunderla@itc-cluster.com
ANECOOP	Maria	Miranda	mmiranda@anecoop.com
	Nicolas	Juste	njuste@anecoop.com
OPPB	Felip Palaus	Martha	oppeixblau@gmail.com
NN	Fenati	Fabio	fabio.fenati@natura-nuova.com
LF	Nyberg Larsen	Jørgen	jnl@lf.dk
LN	Heusler	Julian	jhr@lehman-natur.com
	Rütters	Patrick	
MENSANA	Zelko	Sanja	sanja@korenika.si
FEBEV	Gore	Michael	michael.gore@febev.be
FENAVIAN	Vandewynckel	Anneleen	av@fenavian.be
PNO	Morcillo	Laura	laura.morcillo@pnoinnovation.com
	Fernandez	Marisol	marisol.fernandez@pnoinnovation.com

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The task of the DPS in this project includes the collection, storing and/or analysing the data of this project. In D6.2: DMP 1 agreements and procedures were determined for handling the data correctly and the DPS of each entity should ensure that this is still the case. He/she interacts with the Data Protection Officer (DPO) within their organization, as well as with the DMT of the BREADCRUMB project.

In case of a security incident (e.g. data breach, loss/theft of laptop or USB stick, ...), the DPS should inform the DM and DMT immediately. They will determine by mutual agreement whether notification is necessary to the relevant supervisory body at the time and, if necessary, to those involved and this within 72h of discovering the incident.

In D1.1: Data protocol, D2.2: Case study plans – 1, D2.3: Case study plans – 2, and D2.4: Case study plans - 3 are described what data was collected during the project in WP2. In D6.2 – DMP-1, the procedure of how the data should be collected, processed and stored is described. This includes:

- ✓ methodology and standards to be applied, naming conventions, metadata etc.
- ✓ pseudonymisation/anonymisation guidelines
- ✓ storage during lifetime of the project, security measures
- ✓ main output, how data will be curated and preserved (including after the end of the project)
- ✓ whether data will be shared/made open access, licensed and stored

Figure 3 depicts the flow of the data in the BREADCRUMB project.

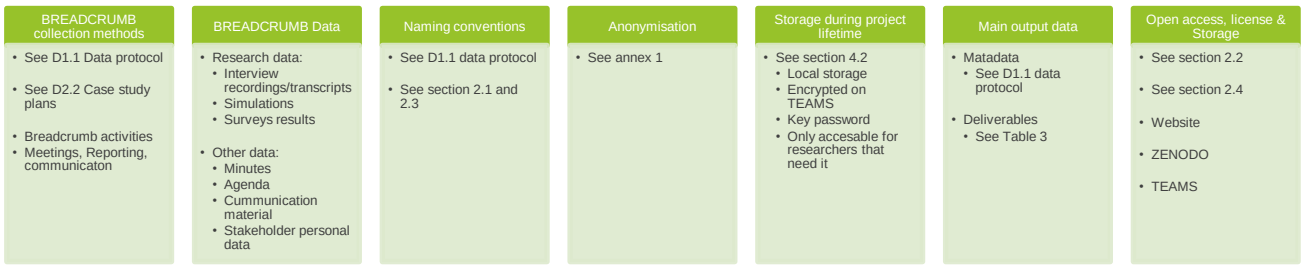

Figure 3: Flow of data in BREADCRUMB project

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2 UPDATE

This section provides an update on any changes made to the procedures. To date, no modifications have been necessary to the Data Management Plan (DMP), and all processes are continuing as initially defined in D6.2 – DMP1. Additionally, there have been no reported security incidents.

Regarding Open Access to data, ZENODO has been selected as the repository, as outlined in section 3.2.3 on page 19. The data will be made publicly available upon publication of the associated scientific papers.

In February 2025, a Community of Practice event was organized in collaboration with the ROSETTA project. During this event, the BREADCRUMB project was presented, along with key results from Work Package 1 (WP1).

An overview of the data collected and generated throughout the project is available in Table 2 and Table 3.

Table 2: Data collection summary by Case Study

Food commodity	Case Study	Data Collection Technique	
		Qualitative (IDI)	**Quantitative (Survey)**
Cereals	Natura Nuova (NN)	5	
	Vila Natura (VN)	5	
Eggs	Landbrug & Fodevarer (LF)	5	
	Avec - ILVO	5	
Fish	OPPPB	5	
Fruits and vegetables	Natura Nuova (NN)	7	
	MC / MCH	8	
	Zelena Tocka (ZT)	16	
	Mensana	11	
	Lehman Natur (LN)	6	Internal data
	ANECOOP	8	
	ILVO – BE	5	
	ILVO – NL	5	
Meat	FENAVIAN	3	11
	AVEC	3	9
	FEBEV	4	19
Total		**101**	**39**

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Table 3: Overview of submitted deliverables

N°	D	Deliverable title	WP	Type	Submitted
1	D1.1	Data protocol	WP1	Report	28/02/2024
2	D6.1	Project handbook	WP6	Report	28/02/2024
3	D1.2	Conceptual model of links between food marketing categories and FW	WP1	Report	29/03/2024
4	D2.2	Case study plan – 1	WP2	Report	29/03/2024
5	D6.2	Data Management Plan (DMP) - 1	WP6	DMP	29/04/2024
6	D5.1	Dissemination, exploitation, and communication plan	WP5	Report	28/06/2024
7	D1.3	Inventory of private & public marketing standards in EU27	WP1	Report	31/10/2024
8	D2.1	EU estimates of FW generated due to marketing standards	WP2	Report	31/10/2024
9	D2.3	Case study plans – 2	WP2	Report	31/10/2024
10	D5.4	Dissemination and communication activities – 1	WP5	Report	23/12/2024
11	D5.9	IP management and exploitation – 1	WP5	Report	23/12/2024
12	D1.4	FW relevant marketing standards	WP1	Report	28/02/2025
13	D2.4	Case study plans – 3	WP2	Report	28/02/2025
14	D2.5	Case study estimates of FW generated due to marketing standards	WP2	Report	28/02/2025 – v1.0 & 27/06/2025 – v2.0
15	D3.1	Modelling framework	WP3	Report	28/02/2025
16	D2.6	Estimates of FW generated due to marketing standards, including FW coefficients	WP2	Report	27/06/2025
17	D4.1	Typology of suboptimal food valorisation options	WP4	Report	27/06/2025
18	D5.2	Dissemination, Exploitation, and Communication Plan - (2)	WP5	Report	27/06/2025
19	D5.7	Practice Abstracts – Batch 1	WP5	Report	27/06/2025
20	D6.3	Data Management Plan (DMP) – (2)	WP6	Report	27/06/2025
21	D6.5	Overall Impact Assessment – (1)	WP6	Report	27/06/2025

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3 FAIR DATA

In this section, we outline our approach to ensuring that the BREADCRUMB project's data adheres to the FAIR principles - Findable, Accessible, Interoperable, and Reusable. Some aspects are yet to be decided. The decisions will be made by the team of Data Protection Stewards (Data Management Team; DMT)

3.1 Making data FINDABLE, including provisions for metadata

In the BREADCRUMB project, ensuring the findability of data begins with establishing clear naming conventions which are very descriptive, and the provision of metadata for data files and datasets. Internally, the project's SharePoint is used. External to the project, findability is enhanced by the assignment of persistent identifiers (PID) which will be globally unique. These conventions are essential for facilitating easy identification and retrieval of relevant data.

To properly arrange and find data and documents internally on SharePoint, the WP structure will be followed. Files and working documents will have the following naming convention:

For any document:

- ✓ Project name_WP/Document name_Event_date DDMMYYYY
    - Example: BREADCRUMB_WP2_Meeting_Agenda_20032024

For final version of deliverables:

- ✓ Project name_WP_Deliverable number_Deliverable Title_Date(DDMMYYYY)_draft or final _version number
    - Examples: BREADCRUMB_WP1_D1.1_Data Protocol_28022024_v1.

The following remarks regarding the naming of electronic records (files) should be followed:

- ✓ use an " _ "instead of space/blank
- ✓ preferably do not exceed 255 characters (to ensure it is readable at 32bit and above operation systems)
- ✓ if the document is modified include a version number and the date of last modification as a denominator required for identification of file content.

The data will be preserved for 5 years on the respective servers of the contributing research institutions, data on the SharePoint platform will be preserved on the servers of EV-ILVO and data on the BREADCRUMB website on the hosting platform.

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Versioning

Version refers to saving new copies of files, so previous versions can be referred to. This practice of tracking and managing changes made to a file over time ensures that a record of changes is being made to the files and to give the new files a unique name. Each time a file is modified, saved, or updated, a new version is created, allowing users to access previous iterations of the file if needed. This process helps in maintaining a history of changes, facilitating collaboration, and ensuring accountability in projects or document management systems. A unique version number should be assigned to each version of a document depending on whether the changes are significant (major) or not (minor).

In the BREADCRUMB project, a strict versioning of the project files and documents will be followed:

- ✓ The author of the document will ensure the current version number is identified on the appropriate place on the first page of the document.
- ✓ The first draft of a document will be version 0.1, while subsequent drafts will be an increase of "0.1" in the version number (e.g., 0.2, 0.3, 0.4, 0.9, 0.10, etc.).
- ✓ The first final version of a document will be Version 1.0, while subsequent final documents will have an increase of "1.0" in the version number (1.0, 2.0, etc.)
- ✓ The second final version of a document after reviewing by a partner will be version 1.1, 1.2, etc.

Metadata

Provenance metadata shows the source and history of an object. All BREADCRUMB datasets must have the following provenance metadata defined in the Data Protocol (D1.1):

dataset PID

dataset description,

dataset date of deposit (data range),

dataset author(s),

dataset venue(internal and external),

dataset embargo,

HE funding statement,

project name,

project acronym,

project number,

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licensing terms,

PID for the authors,

PID for the authors' organizations,

PID for the grant,

PID for related publications and other outputs.

In addition, the data protocol (D1.1) defines additional datatype-specific metadata, enumerating all mandatory metadata to be collected by responsible partners. Alongside the data from the project, relevant metadata will be deposited in repositories identified in D1.1. If the repository offers such an option, keywords for metadata will be available.

Apart from the project's metadata, relevant metadata as specified in the D1.1 will be deposited in the specified repositories (D1.1). If the repository offers the option for harvesting and indexing metadata, then metadata from the project and its various outputs will be indexed and available for harvesting.

3.2 Making data ACCESSIBLE

3.2.1 Open data

All data compiled on the project website will be made publicly available. This includes:

- ✓ Information on existing food marketing standards, as well as anonymized data from case studies, previously approved by the data owner through informed consent.
- ✓ Data concerning the MOA model and Role Playing Games, when applicable and approved by the data owner through informed consent.
- ✓ Details of events and activities, such as venue, date, type of demonstrations, and participating actors.
- ✓ Deliverables, reports, scientific papers, capacity-building materials, and communication and dissemination materials.

Accessing the website requires standard tools: a web browser and, for accessing project documents, MS Office or Linux. Datasets will be anonymized whenever possible. If only pseudonymization is feasible, the dataset will not be publicly accessible due to GDPR regulations. Sensitive stakeholder data held by consortium partners (e.g., email and contact lists) for communication and dissemination purposes must be stored with password-based user authentication on partner institution servers.

3.2.2 Closed (Private) data

Sensitive data, including details of data collection (e.g., date, format, location), must not be openly accessible. Any information that could identify a natural person, or 'Data Subject,' will be anonymized before storage on

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servers. Business-related data, such as company ownership and property details, are considered sensitive and must be removed during data anonymization. For further details on informed consent procedures, see the Ethics section.

3.2.3 Assigning a repository for Open Access of data in the project

The openly available data will be accessible via a free and standardized access protocol. Per the grant agreement, BREADCRUMB will ensure that openly available data is accessible through an open repository. The consortium partners have chosen ZENODO for this purpose due to its platform's safety, trustworthiness, citability, immediate access, flexibility for open or closed access, versioning capabilities, GitHub integration, and usage statistics tracking. This repository will include information accompanying any research output.

BREADCRUMB will hence use ZENODO repository as a main tool for making research data findable in accordance with the HE Open Access mandate. This is based on the recommendation of several project partners who have knowledge of the functional and usage of ZENODO repository in previous projects. There is flexibility for project partners to select other trusted repositories while taking into account the specified guidelines. All preferred repositories were recorded in D1.1. However, if partners prefer another repository, they have to inform the project coordinator. This was discussed at the kick-off meeting.

ZENODO, operated by the Conseil Européen pour la Recherche Nucléaire (CERN), is a portal built upon the widely recognized Global Information Tracker (GIT) version control system and the Digital Object Identifier (DOI) system. Aligned with the FAIR principles, it serves as an ideal choice for this purpose. ZENODO facilitates the discovery, access, reuse, and interoperability of datasets, in line with the requirements of Office of Research and Development (ORD) projects. Its repository services are provided free of charge, allowing researchers to share and preserve various research outputs, including datasets, images, presentations, publications, and software, regardless of size or format. Through established practices like mirroring and regular backups, both the digital data and associated metadata are safeguarded. Each uploaded dataset is allocated a unique DOI, ensuring its distinct identification, traceability, and citability. For publicly available data on ZENODO, the platform's metadata standards can be applied.

The security settings of ZENODO are summarized as follows:

- ✓ Versions: Data files undergo versioning, while records do not. Uploaded data is archived as a Submission Information Package, and derivatives are created without altering the original content. Records can be withdrawn from public view, but both data files and records are preserved.
- ✓ Replicas and file preservation: All data files are stored primarily in the CERN Data Centres in Geneva, with additional replicas in Budapest. These files are maintained in multiple replicas within a distributed file system, which undergo nightly backups onto tape.
- ✓ Retention period: Items remain in the repository for its lifetime, with ZENODO CERN's host laboratory defining a minimum repository lifespan of the next 20 years.

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- ✓ Functional preservation: ZENODO does not guarantee the ongoing usability and comprehensibility of deposited objects over time.
- ✓ Fixity and authenticity: Each data file is stored with an MD5 checksum of its content, and regular checks are conducted against these checksums to ensure the integrity of the file content.
- ✓ Succession plans: In the event of repository closure, ZENODO commits to migrating all content to suitable alternative institutional and/or subject-based repositories.

The dataset PID is allocated by the data repository.

3.3 Making data INTEROPERABLE

In BREADCRUMB, each data file/set should be identified by a unique name, as proposed and elaborated in D1.1 Data Protocol. The naming convention adheres to the following rules:

- ✓ A data file/dataset name consists of several parts (qualifiers) connected by periods,
- ✓ Each qualifier must begin with an alphabetic character (A-Z) or a special character ($,#,@),
- ✓ Each qualifier may contain alphabetic characters (A-Z), digits (0-9), a hyphen (-), or the special characters ($, #, @),
- ✓ Each qualifier should be as short and meaningful as possible,
- ✓ Each data file/set name should be as short and meaningful as possible,
- ✓ Data file/set name should include at least two qualifiers; the first qualifier refers to the data collection method/technique and starts with a capital letter (Table 2)

Table 4: First qualifier that refers to the data collection method

Data collection method/technique	Qualifier
Focus Group Interview	FGI
In-Depth Interview	IDI
Online Survey	Survey
Social Simulation	SocSim
Role Playing Games	RPG
Qualitative Desk Research	Qual
Quantitative Desk Research	Quant

- ✓ If multiple files are produced with the use of the same method/technique in the same case study/task (e.g., multiple in-depth interviews), the first qualifier is appended with a unique number (e.g., IDI01, SocSim01),

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- ✓ The second quantifiers will indicate the food sector. For example: F&V for fruit and vegetable, C for cereals, M for Meat, E for eggs and F for fish.
- ✓ The third qualifiers denote the case study, and/or the related tasks that produce the dataset. This third qualifier is completed with a hyphen and an indication of the location or origin of the dataset. For example: CSx-Y where x = case study number and Y = country code. It could also be related to a task in the BREADCRUMB project. In which case, TX.Y = T1.1 for example followed meaning task title.

Proposed dataset names for all data types generated in BREADCRUMB can be found in Table 1 in deliverable 1.1 Data protocol.

The BREADCRUMB project data ontology is described and mapped in D1.1 Data protocol. Wherever possible, the data will include qualified references[1] to other data.

Grouping the data collection methods and techniques enables us to standardize provenance metadata tailored to the collection approach.

BREADCRUMB has several dedicated tasks and processes to guarantee the data quality: D1.1 Data protocol and D2.2 Case Study Plans, deliverable quality review procedure.

3.4 Enhancing data RE-USE

3.4.1 Licensing

The BREADCRUMB Research data will be licensed under the latest version of CC BY (attribution required) or CC0 (public domain), or an equivalent license. Our standard preference is for CC BY 4.0. However, we may also consider Share-Alike and Non-Commercial Share-Alike licenses for specific portions of the datasets if the Consortium decides to make those parts public.

- ✓ Under the Attribution license, users must appropriately credit the dataset, provide a link to the license, and indicate any changes made.
- ✓ The Non-commercial license prohibits commercial use of the dataset by others, while
- ✓ Share Alike license requires derivative works to be licensed under the same terms as the original data.

Metadata associated with the dataset will be openly available and licensed under a public domain dedication, such as Creative Commons Public Domain Dedication CC0, whenever the data repository allows for such an option. Regardless of the level of protection applied to the empirical data collected in the project, provenance metadata in BREADCRUMB Research must be open under CC0 or an equivalent license, ensuring that

[1] A qualified reference is a cross-reference that explains its intent. For example, X is regulator of Y is a much more qualified reference than X is associated with Y, or X see also Y. The goal therefore is to create as many meaningful links as possible between (meta)data resources to enrich the contextual knowledge about the data. (Source: https://www.go-fair.org/fair-principles/i3-metadata-include-qualified-references-metadata/)

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legitimate interests or constraints are safeguarded. To aid in identifying and collecting relevant metadata, tools tailored to different method types have been prepared for project partners (D1.1).

Upon completion of the project, all simulation code within WP 3 will be open-sourced under an Apache License 2.0. This license balances being open source while permitting commercial users to develop extensions or visualizations without being obligated to open source their additions.

3.4.2 Re-use pathways

Documentation needed for the validation of data analysis, and facilitate data re-use in the project will be provided in the following way:

WP1: The Evidence Search Plan/Methodology (Word) for Task 1.3 will provide information on how and what data was obtained during research and interviews, and the internet or journal sources for already publicly-available resources on food marketing standards and food loss and food waste generation. The subsequent and remaining task in WP1 will rely solely on the data provided in T1.3.

UNIBO: metadata, methodology report, codes, file listing libraries/packages used for running the simulation.

UCPH: Data will be stored in open registry which defiantly facilitate data re-use. Original data will also be made available for reference.

All open datasets, deliverables, and scientific publications will be uploaded to ZENODO. Public deliverables will also be accessible on the official BREADCRUMB website at " https://www.breadcrumb-project.eu/ ". These resources will be linked to the OpenAIRE community to maximize their discoverability. Uploaded files will be appropriately tagged with metadata according to ZENODO standards, as well as tagged with the identifier "BREADCRUMB."

The dataset embargo requires anonymization and obtaining specific participant permission to share potentially redacted transcripts. It may contain personal data, in which case anonymization or sharing only aggregated data would be necessary. Personal data, sensitive data, or data pertaining to companies must be protected. The data will only be made available to external stakeholders after the project, ensuring that it does not compromise the legitimate interests of the beneficiaries.

An embargo period may be implemented if the data, or certain portions of it, will be utilized in published articles in "Green" open access journals. The European Commission recommends a maximum embargo period of 6 months in such cases.

3.4.3 Data quality assurance

BREADCRUMB has several dedicated tasks to guarantee the data quality. They include:

- ✓ D1.1 Data Protocol,

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- ✓ D2.2 Case Study Plans -1 and subsequent updates
- ✓ Deliverable Quality Review template
- ✓ Data Management Plans
- ✓ Data management through institutional data protection stewards (DPS)

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4 DATA OVERVIEW

4.1 Data generated and its purpose

BREADCRUMB strives to improve the understanding of how food marketing standards influence food loss and waste (FLW) generation. This knowledge is crucial to improve the effectiveness of decision-making and engagement of food chain actors, towards zero food waste. To achieve this aim, the project will pursue five detailed objectives (O), and one overall administrative objective.

Objective 1:

To establish a holistic view of the existing food marketing standards in the EU and their interrelations, by placing special emphasis on the least documented ones, that is: (i) private standards, and (ii) standards adopted at the level of specific MS, and to identify the marketing standards which are most relevant to FW generation.

Corresponding WPs: WP1

Main data sources: desktop research supplemented by in-depth interviews (IDI) will be the main data collection and re-use methods. Data in WP1 will be collected to bet an inventory of private and public marketing standards in EU27.

Objective 2:

To create an empirical evidence base, by fusing existing (O1) and project-generated data, to provide estimates of the FW generated due to marketing standards in the supply chains of five targeted food commodities (fruits & vegetables, meat, eggs, cereals, and fish).

Corresponding WP: WP2

Main data sources: desktop research and 16 project case studies implementing surveys, IDI, and focus group interviews (FGI). Further details in D1.1 Data Protocol and D2.3 Case Study Plans - 1.

Objective 3:

To understand and model: (i) the underlying mechanisms through which, marketing standards lead to FW generation, and (ii) the trade-offs between the objective of FW reduction and other objectives pursued by marketing standards. This will be structured to validate solutions (re-balancing) that alleviate the negative impacts of marketing standards to FW, while balancing the trade-offs with their other objectives.

Corresponding WP: WP3

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Main data sources: existing knowledge on Motivation, Opportunity and Ability (MOA) approaches, empirical data collection through social simulation

Objective 4:

To improve market access and business potential of foods that do not meet marketing standards but are still safe to eat (suboptimal foods), by: (i) guiding food businesses in selecting appropriate marketing channels and business models, and assisting them in quantifying their business value; (ii) fostering change in consumers' and businesses' attitudes towards sub-optimal foods, through nudging marketing cues.

Corresponding WP: WP4.

Main data sources: analytical and report input from WP1 (D1.2: Conceptual Framework, D1.3: Inventory of private and public marketing standards in EU27, and D1.4 FW-relevant marketing standards), WP2 (D2.1 EU estimates of FW generated due to marketing standards, D2.3 Case study estimates of FW generated due to marketing standards, and D2.6 Estimates of FW generated due to marketing standards, including FW coefficients), and WP4 (D4.1 Typology of suboptimal food valorisation options).

Objective 5:

To effectively manage the upscaling of the project results by: (i) developing operational guidelines and policy recommendations on how to prevent/reduce FW due to marketing standards, and thereby contributing to environmental sustainability and circularity of the food system; (ii) formulating a Code of Conduct balancing commercial and social value from suboptimal foods, and thereby contributing to economic sustainability and food poverty reduction; (iii) developing a strategy for the exploitation of key project results by the project partners (individually and jointly); (iv) undertaking appropriate dissemination and communication actions to maximise the project's impact; (v) establishing formal agreements (MoUs) with relevant projects to achieve impact synergies.

Corresponding WP: WP5.

Objective 6:

To ensure

- ✓ the effective administration of project activities according to EU rules, and to sound project management practices;
- ✓ that all project outcomes are delivered according to the agreed time- and resource-planning;
- ✓ that all potential risks are identified at an early stage, and appropriate mitigation actions are taken;
- ✓ a sound ethical treatment of participants and to meet laws and regulations regarding data management.

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Corresponding WP: WP6

4.2 Data type and formats

BREADCRUMB has a complex and multidisciplinary nature requiring various types of data. These data will come from several sources, stored in various formats. The gathered data will be analysed or processed resulting into a set of deliverables (Table 3) which will be used in communication and dissemination activities.

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Table 5: Deliverable overview according to the BREADCRUMB Grant Agreement

N°	D	Deliverable title	WP	Responsible	Type	Date to be sent for review	Reviewer 1	Reviewer 2	Dissemination level	Due date
01/01/2024 – 31/12/2024										
1	D1.1	Data protocol	WP1	EV-ILVO	Report	-	VLTN	-	SEN	29/02/2024 (M2)
2	D6.1	Project handbook	WP6	EV-ILVO	Report	1/02/2024	PNO	-	SEN	29/02/2024 (M2)
3	D1.2	Conceptual model of links between food marketing categories and FW	WP1	VLTN	Report	29/02/2024	EV-ILVO	CREDA	PU	31/03/2024 (M3)
4	D2.2	Case study plan – 1	WP2	EV-ILVO	Report	29/02/2024	VLTN	UNIBO	PU	31/03/2024 (M3)
5	D6.2	Data Management Plan (DMP) - 1	WP6	EV-ILVO	DMP	31/03/2024	ITC	PNO	PU	30/04/2024 (M4)
6	D5.1	Dissemination, exploitation, and communication plan	WP5	PNO	Report	30/05/2024	EV-ILVO	MC	SEN	30/06/2024 (M6)
7	D1.3	Inventory of private & public marketing standards in EU27	WP1	VLTN	Report	30/09/2024	UCPH	CREDA	PU	31/10/2024 (M10)
8	D2.1	EU estimates of FW generated due to marketing standards	WP2	UCPH	Report	30/09/2024	EV-ILVO	UNIBO	PU	31/10/2024 (M10)

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9	D2.3	Case study plans – 2	WP2	EV-ILVO	Report	30/09/2024	UCPH	CREDA	PU	31/10/2024 (M10)
10	D5.4	Dissemination and communication activities – 1	WP5	PNO	Report	30/11/2024	VLTN	ITC	PU	31/12/2024 (M12)
11	D5.9	IP management and exploitation – 1	WP5	PNO	Report	30/11/2024	MC	EV-ILVO	SEN	31/12/2024 (M12)
01/01/2025 – 31/12/2025										
12	D1.4	FW relevant marketing standards	WP1	VLTN	Report	31/01/2025	UNIBO	UCPH	PU	28/02/2025 (M14)
13	D2.4	Case study plans – 3	WP2	EV-ILVO	Report	31/01/2025	VLTN	UNIBO	PU	28/02/2025 (M14)
14	D2.5	Case study estimates of FW generated due to marketing standards	WP2	EV-ILVO	Report	31/01/2025	CREDA	AINIA	PU	28/02/2025 (M14)
15	D3.1	Modelling framework	WP3	UNIBO	Report	31/01/2025	CREDA	EV-ILVO	PU	28/02/2025 (M14)
16	D2.6	Estimates of FW generated due to marketing standers, including FW coefficients	WP2	EV-ILVO	Report	31/05/2025	UCPH	UNIBO	PU	30/06/2025 (M18)
17	D4.1	Typology of suboptimal food valorisation options	WP4	MC	Report	31/05/2025	AINIA	PNO	PU	30/06/2025 (M18)
18	D5.2	Dissemination, exploitation and communication plan – 2	WP5	PNO	Report	31/05/2025	CSCP	EV-ILVO	SEN	30/06/2025 (M18)

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19	D5.7	Practice abstracts batch 1	WP5	PNO	Report	31/05/2025	EV-ILVO	VLTN	PU	30/06/2025 (M18)
20	D6.3	Data Management Plan (DMP) – 2	WP6	EV-ILVO	DMP	31/05/2025	ITC	PNO	PU	30/06/2025 (M18)
21	D6.5	Overall impact assessment – 1	WP6	EV-ILVO	Report	31/05/2025	VLTN	UNIBO	SEN	30/06/2025 (M18)
22	D3.2	Modelling interactions of marketing standards and FW generation	WP3	UNIBO	Report	30/11/2025	EV-ILVO	UCPH	PU	31/12/2025 (M24)
23	D3.3	Modelling trade-offs between reducing FW and other objectives	WP3	CREDA	Report	30/11/2025	VLTN	UNIBO	PU	31/12/2025 (M24)
24	D4.2	Consumer acceptance and segmentation for suboptimal foods	WP4	AINIA	Report	30/11/2025	MC	ITC	PU	31/12/2025 (M24)
25	D5.5	Dissemination and communication activities – 2	WP5	PNO	Report	30/11/2025	CSCP	MC	PU	31/12/2025 (M24)
26	D5.10	IP management and exploitation - 2	WP5	PNO	Report	30/11/2025	MC	EV-ILVO	SEN	31/12/2025 (M24)
01/01/2026 – 31/12/2026										
27	D5.3	Dissemination, exploitation and communication plan – 3	WP5	PNO	Report	31/05/2026	CSCP	VLTN	SEN	30/06/2026 (M30)
28	D6.4	Data Management Plan (DMP) – 3	WP6	EV-ILVO	DMP	31/05/2026	ITC	PNO	PU	30/06/2026 (M30)

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29	D3.4	Solutions to alleviate negative impacts to FW, while balancing trade-offs	WP3	UNIBO	Report	31/08/2026	VLTN	EV-ILVO	PU	30/09/2026 (M33)
30	D4.3	Suboptimal food, business assessment model	WP4	VLTN	Report	31/08/2026	AINIA	CREDA	SEN	30/09/2026 (M33)
31	D4.4	Marketing cues for suboptimal foods	WP4	AINIA	Report	31/08/2026	CSCP	UNIBO	PU	30/09/2026 (M33)
32	D5.6	Dissemination and communication activities – 3	WP5	PNO	Report	30/11/2026	CSCP	MC	PU	31/12/2026 (M36)
33	D5.8	Practice abstracts batch 2	WP5	PNO	Report	30/11/2026	EV-ILVO	VLTN	PU	31/12/2026 (M36)
34	D5.11	IP management and exploitation – 3	WP5	PNO	Report	30/11/2026	MC	EV-ILVO	SEN	31/12/2026 (M36)
35	D5.12	Food Marketing Standards Interest Group	WP5	EV-ILVO	Report	30/11/2026	PNO	UNIBO	SEN	31/12/2026 (M36)
36	D5.13	Innovation Impact Synergies	WP5	EV-ILVO	Report	30/11/2026	VLTN	AINIA	PU	31/12/2026 (M36)
37	D5.14	FC actors' guidance on reducing FW caused by marketing standards, including a Self-Regulatory Code of Conduct	WP5	MC	Report	30/11/2026	PNO	CSCP	PU	31/12/2026 (M36)
38	D5.15	Owners and Regulators' assistance on preventing FW caused by marketing standards	WP5	UNIBO	Report	30/11/2026	UCPH	CREDA	PU	31/12/2026 (M36)

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39	D6.6	Overall impact assessment – 2	WP6	EV-ILVO	Report	30/11/2026	VLTN	UNIBO	SEN	31/12/2026 (M36)

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The quality of the above deliverables will be ensured by following criteria highlighted in the Quality Check tool (Annex 7.1).

In addition to the deliverables listed on Table 3, general activities of the BREADCRUMB consortium will generate:

- ✓ Press articles in partners' media or other media related to food and agriculture, internet posts through social media
- ✓ photos from events, demonstration activities, meetings
- ✓ videos on YouTube channel and social media
- ✓ tabular (quantitative) and qualitative data
- ✓ email/contact lists, used for output dissemination. This will be confidential
- ✓ PowerPoint presentations or brochures, leaflets, posters, roll-ups from events / fairs / conferences
- ✓ Scientific publications.

Social media channels associated to the project include

- ✓ Website: https://www.breadcrumb-project.eu/
- ✓ X: https://x.com/BREADCRUMB_HE?t=jOooZO9eZsLpGDpGyEAOxA&s=09
- ✓ LinkedIn: https://www.linkedin.com/company/BREADCRUMB-project/?lipi=urn%3Ali%3Apage%3Ad_flagship3_search_srp_all%3BGs3llVLfTBiLZijl%2BYOTyw%3D%3D
- ✓ YouTube: https://www.youtube.com/channel/UCW3Y9X4RkDFQdVSR4Ca8OXg

This list of data produced will be reviewed and updated in the subsequent versions of the Data Management Plan to ensure all datasets are captured.

Examples of data in BREADCRUMB include survey results, simulations, interview recordings (audios) and videos obtained with the involved parties' consent. The format of the recordings will be either mp3 or mp4. The recorded data will be transcribed. The format of the transcription will be: text and image(s). The reports produced will have a summarised findings with format .txt, .docx

The formats of final dataset will be: CSV and/or Word document with basic results/descriptive analysis, .txt, .docx.

4.3 Data provenance

Related to the data origin or provenance, the D1.1 Data Protocol details the data to be collected within each WP.

Primary data on case studies will be collected by the consortium members. Two deliverables, the D1.1 Data Protocol and D2.2 Case study Plans -1 elaborates per case study on the data that will be collected. Also, in

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WP4 where primary data will also be collected from consumers in 27 EU, the D1.1 elaborates on its provenance.

Secondary data will be collected from multiple sources, for multiple tasks in different WPs including official databases, surveys, reports, scientific studies and other European projects and for multiple levels: European, national, regional and local.

The data origin will be explained in each deliverable. The use of existing data or the generation of new data will be clearly identified in each deliverable produced. The ethical clearance of all data, both new and existing, will be addressed by each WP leader and will be clearly reported.

The gathered data will be analysed or processed resulting into a set of deliverables and used in communication and dissemination activities.

All BREADCRUMB datasets must have a dataset persistent Identifier (PID), assigned by the indicated data repository.

4.4 Data utilisation

BREADCRUMB datasets will be potentially used by three main groups: the consortium partners, the scientific community and the end-users. This last group is a very diverse group, and considering the five food sectors targeted in the project (fruits and vegetables, cereals, eggs, meat and fish), they include: food producers, food businesses, food processing, retail, policy makers (EU, National and Regional governments and local authorities), educational institutions, citizens/consumers/households/, schools.

At different levels, the data users during the course of the project will primarily be the 21 consortium partners, who have specified and expected data needs.

All information aimed at the scientific community (project reports, deliverables, publications) will be centralised on the BREADCRUMB project website https://www.breadcrumb-project.eu/

In addition, the results and insights for external stakeholders and other end users will be made publicly available on the project website. Given the fact that each consortium partner has a network, a non-determined number of institutions, enterprises and organisations interested in European food system issues especially food marketing standards and food waste generation may also be potential users of the data generated and insights from the project.

Furthermore, the Dissemination, Exploitation, and Communication Plans (D5.1, D5.2 and D5.3) will detail how to reach these end-users.

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Furthermore, we will collaborate with the sister project ROSETTA, other FLW-related projects such as ZeroW, CHORIZO, SISTERS, etc. and the JRC to discuss possible joint communications for similar end-users. The resulting approach, if necessary, will be described in an update of the DMP.

4.5 Re-use of data

Data re-use will be present, particularly in the collection and analyses of information on existing food marketing standards (WP1), the collection and analyses of food waste estimates due to marketing standards (WP2), and the use of MOA approaches in the modelling work (WP3).

Previous experiences and research will serve as data sources and will be collected through (i) the involved partners; (ii) a screening of existing projects and databases, (iii) collaboration with JRC, and sister project ROSETTA.

The access to sensitive raw data collected on existing food marketing standards, and on estimates of food waste due to these marketing standards, interviews and similar primary data generated within the project, will be limited to the project partner who collect these data. Only pseudonymised or anonymised data will be shared by the collecting partner with the project partners involved in het BREADCRUMB project. In case of pseudonymised data (which is still personal data) access is only granted if necessary, in the context of data analysis within the framework of the BREADCRUMB project. For this, anonymous survey data are in a folder on BREADCRUMB MS Teams and pseudonymised data will be stored in an encrypted folder on BREADCRUMB MS teams, accessible only to partners involved in data analyses.

The non-confidential data generated within the BREADCRUMB project will be available for re-use by the consortium partners after the project ends and will be stored on the project SharePoint hosted by EV-ILVO.

The duration of kept data will be discussed in the next Technical Coordination Board (TCB) meeting. The publicly available data will be stored on the BREADCRUMB website (https://www.breadcrumb-project.eu/) for at least 3 years after the project ends.

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4.6 Practicalizing the FAIR principles per WP

Table 6: Implementation of the FAIR principle per WP

WP	Partner	Expected size of data	Description	Reference to other data	Re-use of data	Purpose of data
WP1	VLTN	Data (generated from desktop research and >200 interviews from food chain stakeholders in EU27 and from the 16 project case studies) on existing private and Member-State food marketing standards	An evidence search plan and methodology has been developed in the framework of T1.3 will provide information on how and what data was obtained during the desktop research and interviews, and the internet or journal sources. T1.4 will rely fully on the data gotten from T1.3	Yes	Collection and analyses of data on private and Member-State food marketing standards	Collection and re-use of data on existing private and Member-State food marketing standards to define hypotheses on in T1.4: (i) the links and the cause-effect intensity (in qualitative terms) between specific food marketing standards and FW; (ii) the links between different food marketing standards. Based on these, a preliminary identification of FW-relevant marketing standards will be developed
WP2	UCPH	Data generated from desktop research and interviews on estimates of FW as a results of marketing standards in the 27 EU countries. A minimum of 200 stakeholders will be reached.	An aligned evidence search plan and methodology as that of T1.3 will be employed in T2.1 to collect information through desktop research and in-depth interviews on estimates of FW due to marketing standards	Yes	Collection and analyses of data on FW estimates due to food marketing standards	To estimate FW in 27 EU countries for five food sectors due to marketing standards

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	ILVO	16 case studies, sample sizes are detailed within the D1.1 Data Protocol and D2.2 Case Study plans -1		No	The storage of results of evidence-based analyses of existing food marketing standards and their potential to generate FW (estimates)	Collection of data on 16 case studies (further details in D1.1 Data Protocol and D2.2 Case Study Plans - 1)
WP3	UNIBO	Modelling, role playing games and social simulation: possible to specify in M24	Metadata, methodology report, codes, file listing libraries/packages used for running the simulation	No	The use of MOA approaches in the modelling work	Existing knowledge MOA approaches, empirical data collection through social simulation
WP4	MC	Qualitative data generated through interviews of stakeholders (number to be determined in M15)	Desktop qualitative research data on the typology of suboptimal foods. One specific food product from each of the targeted food commodities will be selected based on: (i) the high influence of marketing standards (based on the results of T1.4), and (ii) the food product's strong potential business	Yes		Analytics in WP1, WP2, WP3 will feed or guide the data to be collected and analysed
	AINIA	Qualitative and Quantitative data generated from	Survey on consumer acceptance of suboptimal foods generated	Yes		Analytics in WP1, WP2, WP3 will feed or guide the data to be collected and analysed

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		approximately 500 consumers in 27 EU countries through online survey.	through online survey which ill-target 500 consumers			
WP5	PNO	Relatively in small size	Some Excel files, Word files, templates, logos which are internally shared within the consortium. Public information is stored on the website and in the newsletters.		N/A	Gather data relating to business and upscaling strategies for exploiting project results that are innovative. Also, to provide templates to the partners in the consortium to professionalize the working methods e.g. templates for deliverables, presentations, slide deck. Some documents also have the purpose to collect info from the partners for example, reporting tools (excel files) regarding dissemination, exploitation and communication.
WP6	EV-ILVO	Relatively in small size	Some Excel files, Word files, templates, which are internally shared within the consortium.	No	N/A	The documents will only be used for internal project management for example contact list, meeting minutes, … and for communication with external stakeholders.

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5 ALLOCATION OF RESOURCES

5.1 What will the costs be for making data and other research outputs FAIR in your project?

Costs for data storage is to be kept at a minimum in BREADCRUMB using free services and tools, like ZENODO and project MS Teams site. Still, some costs may still incur. The current foreseen costs for making data FAIR includes:

- ✓ Fees associated with the publication of scientific articles containing project's research data in "Gold" Open access journals. The cost sharing, in case of multiple authors, shall be decided among the authors on a case-by-case basis.
- ✓ Project website development and operation: budget of PNO. The requirement is to maintain the website 6 months after the completion of the project.
- ✓ Data archiving at ZENODO and on other online data base: free of charge.
- ✓ Copyright licensing with Creative Commons: free of charge.

Costs related to open access to research data in Horizon 2020 are eligible for reimbursement under the conditions defined in the BREADCRUMB Grant Agreement, in particular Article 6 ("Eligible Cost") and Article 6.2. ("D.2 Costs of other goods and services"), but also other articles relevant for the cost category chosen.

Project beneficiaries will be responsible for applying for reimbursement for costs related to making data accessible to others beyond the BREADCRUMB Consortium. To be eligible, costs must be:

a) purchased specifically for the action and in accordance with Article 10.1.1 (best value for money)

or,

b) contributed in-kind against payment and in accordance with Article 11.1 (rules for in-kind contributions for against payment).

5.1.1 How will these costs be covered?

Other costs may incur during the project's lifetime and will be evaluated as eligible or not as specified in the Grant Agreement. Each partner is responsible for the data they produce. Any fee incurred for Open Access through scientific publication of the data will be the responsibility of the data owner (authors) partner(s).

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5.1.2 Who will be responsible for data management in your project?

Data manager of BREADCRUMB is EV-ILVO. Capwell Echo Forbang is the DPS of EV-ILVO.

5.1.3 How will long-term preservation be ensured?

The default long-term preservation will be through ZENODO. ZENODO states that: "Items will be retained for the lifetime of the repository. This is currently the lifetime of the host laboratory CERN, which currently has an experimental programme defined for the next 20 years at least." Since uploading to ZENODO is free of charge this is expected to keep overall retention costs small.

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6 DATA SECURITY

6.1 What provisions are or will be in place for data security?

Raw data will not be shared because it is subject to privacy laws. Only pseudonymised or anonymised data will be shared by the collecting partner with the project partners involved in het BREADCRUMB project. In case of pseudonymised data (which is still personal data) access is only granted if necessary, in the context of data analysis within the framework of the BREADCRUMB project. See Annex 8.2 for guidelines on anonymising and pseudonymising data.

At the level of the BREADCRUMB project partners:

When data is collected the collecting partner is responsible for data anonymisation (when working with surveys) or pseudonymisation (when working with interviews),

Prior to data analysis and/or data sharing:

For interviews

- ✓ If the participant gives consent, data will be collected by recording. If the participant does not consent to recordings, notes will be taken.
- ✓ Obtained personal data are processed on a secure server of the data collecting entity in folders to which only its researchers involved in this BREADCRUMB research activity have access.
- ✓ After conducting the interview, personal data will be pseudonymised by the collecting partner. A transcription of the interview is made where directly identifiable elements have been replaced by a code.
- ✓ After transcribing the interview, the recording is deleted by the collecting partner. Recordings of interviews will be deleted within 3 months
- ✓ The link between the identity of the data subject and the code will be stored in highly restricted key file by the collecting partner.
- ✓ The link between the identification data and coded data is made only by the collecting partner (1) for sending invitations to continue participation in the study (2) for linking the new answers to the old answers in the context of follow-up research.
- ✓ Data analyses are only done on the basis of pseudonymised data.
- ✓ The pseudonymised data are stored on protected and backed-up network drives of the collecting partner with limited physical and digital access and in an encrypted folder on BREADCRUMB MS Teams. Only pseudonymised data will be shared for analyses within the project. Only partners responsible for data analysis in other work packages and tasks have access.

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For surveys

Online surveys conducted will be anonymous. The choice is made to conduct anonymous surveys as much as possible. However, if we still want to ask questions at the participant as part of follow-up research by the collecting partner (e.g. through interviews via voluntary shared email address), non-anonymous surveys are needed. If online surveys will be non-anonymous:

- ✓ Data will be collected using a GDPR-proof tool (e.g. Lime survey) and will be automatically stored on a secured server of the data collecting entity in folders to which only its researchers involved in this BREADCRUMB research activity have access.
- ✓ Incoming responses are anonymised by the collecting partner before made accessible for analysis by the project partners. Attributes that could potentially identify a consumer or a respondent, such as an email address or combinations of attributes is deleted. There is no longer a link by which consumer or participant can be identified.
- ✓ For analysis, the anonymised dataset is used in preference to the non-anonymous dataset. The non-anonymous dataset is only consulted in the context of follow-up research by the collecting partner (see above)
- ✓ The anonymised dataset are stored on protected and backed-up network drives of the collecting partner and in a folder on BREADCRUMB MS Teams. Only anonymised dataset will be shared for analyses within the project.

When storing/processing data, identification and analysis data should be stored separately with a common code. In this way, access to the identification data can be strictly limited and monitored. Only the person, who has the key to the code, can retrieve the person behind the code number. The key is kept on protected and backed-up network drives of institutions themselves in folders to which only the relevant researchers of the BREADCRUMB project have access. See Annex 7.2 for guidelines on anonymising and pseudonymising data.

The analyses are conducted only based on pseudonymised data. The pseudonymised data are stored on protected and backed-up network drives of the institutions themselves and in encrypted folders on BREADCRUMB MS Teams (where it should be checked whether everyone needs access to pseudonymised data). See Annex 7.2 for guidelines on anonymising and pseudonymising data.

Outside the BREADCRUMB project:

If necessary, data transfer to and from end-users (including transfer of sensitive data if allowed) is performed encrypted, either sent by encrypted ZIP or RAR files, or by download directly as web-based services from servers. In any case strong password is required for accessing transferred datasets and passwords must be sent separately from the dataset (preferably using also different channels of communication e.g. WhatsApp).

6.2 Will the data be safely stored in trusted repositories for long term preservation and curation?

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The default long term preservation will be through ZENODO. ZENODO states that: "Items will be retained for the lifetime of the repository. This is currently the lifetime of the host laboratory CERN, which currently has an experimental programme defined for the next 20 years at least." Since uploading to ZENODO is free of charge this is expected to keep overall retention costs small.

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7 ETHICS

7.1 Are there, or could there be, any ethics or legal issues that can have an impact on data sharing?

The proposed work in BREADCRUMB will fully comply with the regulations set out in Article 14 of the Grant Agreement, which states that all activities must be carried out in compliance with:

- ✓ Ethical principles (including the highest standards of research integrity, e.g. the principles of the European Charter for Researchers and The European Code of Conduct for Research Integrity), and
- ✓ Applicable international, EU, and national laws (in particular the GDPR).

To ensure this, BREADCRUMB works with the Commission for Ethics in Social Science and Humanities (ComESSH) at ILVO who's president Prof. Fleur Marchand will act as Ethics Mentor of the BREADCRUMB project. ComESSH will advise the project on a regular basis throughout the project, and provide ethical approval and clearance on data collection protocols (see annex 7.4). The specific issues that the commission will provide advice on are listed below.

Humans:

The project will implement qualitative and quantitative studies by involving the stakeholders in interviews, surveys, case studies and experiments. BREADCRUMB has the help of ComESSH. ComESSH carries out the ethical evaluation of research in the domain of 'social research' that is, "Research with human participants not covered by the Experiments Act of May 7, 2004". The ethics advisor (Fleur Marchand) will advise use on the procedures and criteria that will be used to identify/recruit research participants, but also the specific target groups.

Personal Data:

Understanding people's behaviour is key for BREADCRUMB. While the project aims to better understand the relationship between food waste and marketing standards, and identify solutions to alleviate the negative impacts on food waste, the other key objective is to improve market access to enhance the business potential for food that is safe to eat, but does not meet specific marketing standards. In this respect, information about consumers' attitudes – in particular as regards sub-optimal food - is paramount. Understanding the expanse of consumer preferences for certain foods cannot be fully accomplished unless an integrated gender perspective as well as intersectional analysis is incorporated into the project. BREADCRUMB integrates both throughout its work, keeping in mind that gender and intersectional differences can affect the design of and

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response to marketing standards, affecting individual food choices, usage, and waste. Specifically, the project will:

- ✓ formulate research questions and obtain empirical data on the inter-relationship between marketing standards and gender, as well as other strata of society - with a focus on how marketing standards may determine food choices and ultimately waste;
- ✓ ensure that gender and intersectional analysis is included as a horizontal component in the case studies;
- ✓ incorporate the gender perspective and intersectional analysis to determine the best framework/way forward to increase market access and the business potential of 'sub-optimal' but safe to eat food;
- ✓ draft the results of the project in gender-neutral language;
- ✓ provide gender-disaggregated data;
- ✓ disseminate the project's outputs/results to a broad group of end-users, including those focused on gender and intersectional factors;
- ✓ appoint a Gender-Issues Manager (Sofie De man, EV-ILVO) to ensure that the gender dimension is addressed throughout the project

Artificial Intelligence and machine learning

Within BREADCRUMB we utilize well-known and documented AI-techniques mainly involving agent-based modelling and machine learning (e.g. Bayesian Networks) to help improve understanding of food waste in relation to marketing standards. This will happen in WP2, WP3, WP4. The AI systems are considered low risk since

- ✓ they will not be called to make autonomous decisions,
- ✓ only AI experts will be using them,
- ✓ they will be used only as a means to obtain statistically significant results that will be evaluated by experts,
- ✓ and results will be reported considering potential inaccuracies and uncertainties and will undergo evaluation through various official channel before suggestions can be passed to the market.

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7.2 Will informed consent for data sharing and long-term preservation be included in questionnaires dealing with personal data

Informed consent for data sharing and long-term preservation

Both online and live interviews and questionnaires will be conducted in accordance with the EU Law (no. 97/2008, 104/2009, 68/2012 and 107/2012). The prior information will be provided to the interviewees in accordance with Article 15 and their consent (i.e. authorisation to collect, process, use data, preserve on a long term and share) will be asked for: in writing in case of oral interviews, and by clicking an “I Agree” button at the bottom of the page in case of online questionnaires, which will contain all the information included in the informed consent form and the information sheets (Annex 7.3).

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8 ANNEX

8.1 Annex 1: Breadcrumb Deliverable Quality Review tool

Please make sure the following checks are completed prior to sending the document for final quality review (to project consortium internal quality reviewer). Quality reviewer to countersign prior to sending to project manager for submission.	Lead beneficiary - author's initials	Quality reviewer(s) initials	Overall quality score (Excellent, Good, Needs review)
Content			
Overall assessment: the content of the deliverable complies to the deliverable description in the GA			
Overall assessment: the content of the deliverable is sufficient to demonstrate the execution (completion of work) as per the deliverable originating task description			
Executive summary: description of the purpose of the deliverable/main problem it is solving			
Executive summary: very high-level description of the methodology used to reach the results			
Executive summary: high-level summary of main results			
Introduction: explain how each of the requirements for the deliverable content are met through the deliverable structure			
Chapters: is the problem the deliverable trying to solve described well?			
Chapters: detailed description of methodology/approach/tools used. The information provided should be describing how/what steps we have followed to achieve the deliverable results			

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Chapters: if the methodology/approach… description is turning out to be a very large section, or you are prviding evidence for data gathering (e.g. survey results, data sources) - those need to be included in the appendices and cross-referenced with the text			
Chapters: are there alternative solutions? Why did we choose ones and discarded others? Provide motivation for choices			
Chapters: is the result clearly included?			
Conclusion: summary of result included?			
Conclusion: how this result will feed to the following tasks in the project?			
Appendices: include all relevant information (e.g. survey questions/results, relevant documents that will have value to be included in the deliverable to provide context or motivate a decision, etc.)			
Compliance tables at start of the document			
Deliverable description table is completed (without submission date)			
The deliverable dissemination level is checked against the GA requirement.			
The deliverable write ups are described, and authors provided.			
Quality review table is completed, and individual reviews are described.			
Editorial			
Spell check English (United Kingdom) - completed			
When collaborative deliverable (multiple authors): style of writing is the same across sections with different authors.			
Proper language is used for the respective type of deliverable.			

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Tables have same/similar style/design.			
Text in tables and figures is readable.			
All figures and tables have captions (following the template format).			
References to figures/tables are linked to the respective captions (cross-references working, no error messages).			
All header/footers are following the template formatting.			
Page numbering is correct (especially when there are section breaks).			
The line spacing used in Normal paragraphs is: single.			
The space before paragraphs is: 0 pt (unless change required to fit a figure/table).			
The space after paragraphs is: 12 pt (unless change required to fit a figure/table).			
There are no empty lines after headings.			
There are no empty lines between paragraphs (unless change required to fit a figure/table).			
There are no large blank spaces on the pages. If required to minimize the blank spaces, move tables/figures before/after paragraphs and cross reference the relevant texts for clarity.			
All the acronyms used are included in the respective table at the start of the document and are explained.			
Table of contents includes at least 3 levels of headings.			
Table of contents, list of figures, list of tables are updated. Pages are correct.			
Plagiarism			

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All sources of information are properly referenced in the document, authors and publications clearly stated.			
There are NO "copy/paste" of texts from internet, previous deliverables, other published documents.			
Every image sources is clearly shown in the figure caption (for images that are not specifically created for the project/deliverable). Do we have permission to use those images?			
Same as above for tables: if not created for the project and external source used, this needs to be shown in the caption and rights to use in the deliverable should be ensured from the publisher/author.			

8.2 Annex 2: Info sheet anonymising or pseudonymising data

8.2.1 Why anonymise or pseudonymise?

To protect personal data (privacy-sensitive information), you are required by the GDPR (General Data Protection Regulation) to implement various organisational and technical security measures.

According to GDPR, "personal data" means:
"any information relating to an identified or identifiable natural person ("the data subject"); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more elements characterising the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person."

"pseudonymisation" means according to GDPR:
"processing personal data in such a way that the personal data can no longer be linked to a specific data subject without the use of additional data, provided that such additional data are kept separately and technical and organisational measures are taken to ensure that the personal data are not linked to an identified or identifiable natural person;

Here, **anonymisation or pseudonymisation** is seen as an important security measure to reduce the risk of the data subjects (the individuals to whom the data relates).

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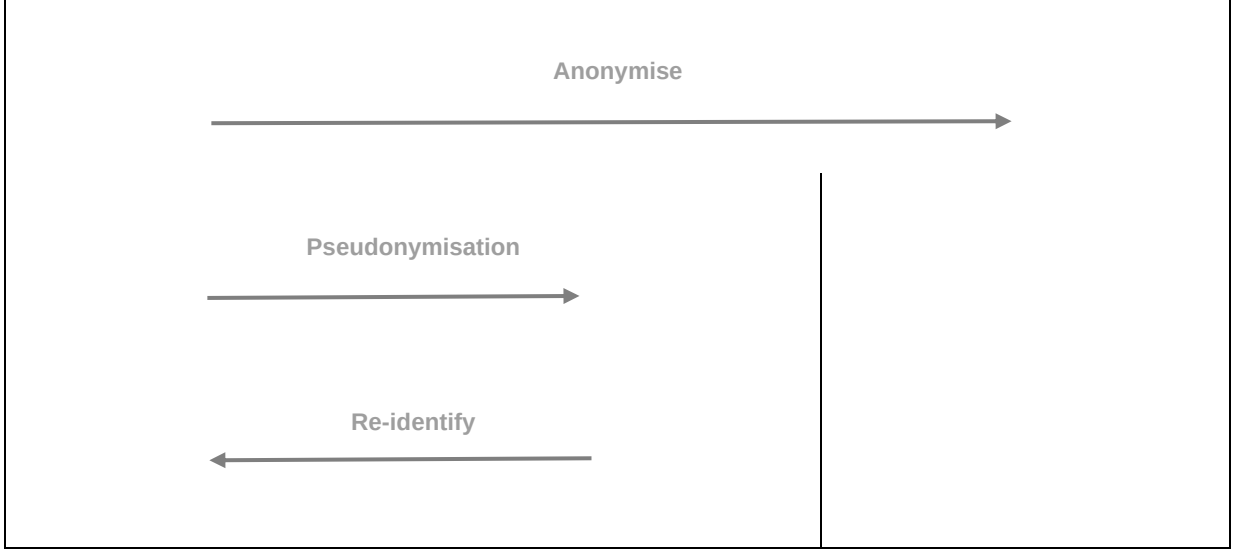
For example: to avoid losing valuable information during an interview, interviews or focus group discussions, are often recorded. However, audio files are highly privacy-sensitive information and, in the context of data minimisation, should be made 'safe' as soon as possible by anonymising or pseudonymising. After all, you should not process more data than is strictly necessary for your intended purpose. The ILVO guideline for retention of audio/video recordings is 2 to 3 months unless otherwise specified by the client (and then this must be communicated in the informed consent). Data minimisation ensures that the privacy risk of the data subject (in this case, interviewees/participants of focus group discussions) is reduced: after all, what you do not own, you cannot lose or end up in the wrong hands (unauthorised persons, hackers, etc.).

8.2.2 What is anonymisation or pseudonymisation?

Anonymisation is not the same as pseudonymisation (see table 1).

Table 1: Anonymisation is not the same as pseudonymisation

Identified personal data	Pseudonymised personal data	Anonymous data
E.g. Audio recording	E.g. Pseudonymised transcript	E.g. Anonymised written report
Linkable without additional data to data subject	Linkable with additional data to data subject	Unlinkable to data subject
Data subject* is identifiable	Person involved is re-identifiable	Data subject is no longer (re-)identifiable
Personal data	Personal data	No personal data
GDPR applicable	GDPR applicable	GDPR not applicable



* The individual person to whom the data relates

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With **anonymisation**, you process your raw data until all options for (re)identification are irreversibly removed. There is no longer any link to the data subject. The data subject can no longer be (re)identified.

This is why both direct identifiers and indirect identifiers must be removed or replaced.

- Direct identifiers: data that allow you to directly identify the data subject. For example: name, address, telephone number, e-mail address, IP address, recognisable image of a data subject, voice of a data subject, etc.
- Indirect identifiers: based on a combination of data it is possible to (re)identify the data subject. For example: the combination of farm type, municipality business seat and age.

The GDPR legislation no longer applies.

For example: anonymised written report of focus group discussion.

With **pseudonymisation**, you process your raw data until you can no longer link the pseudonymised data (= analysis data) to the data subject without using the data subject's additional data.

You store the link between the identity of the data subject and the pseudonym (= identifying data) in a separate file: the key file. Access to the key file is highly restricted and only accessible for a limited number of people.

Analyses are done only on the basis of the pseudonymised data.

The GDPR legislation does still apply because the pseudonymised data is linkable to the data subject on the basis of the key file.

Example: transcription of interview where directly identifiable elements have been replaced by a pseudonym (=code). List of interviewees' names and codes used in the pseudonymised transcript are kept in highly restricted key file.

8.2.3 When to anonymise or pseudonymise?

When anonymisation is not possible or not desirable in function of your intended purpose of your scientific research, pseudonymisation is brought forward from the GDPR to protect your personal data.

For example: in the context of follow-up research, you want to be able to ask questions of the interviewee later on.

Sometimes, in the context of research, it is important that you do not anonymise or pseudonymise the recording. For example: consider a practice video or a video testimonial to promote and disseminate best farming practices and innovations.

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In each case, however, it is important that you inform the data subjects about this in the informed consent and that the data subjects have given their explicit consent to this.

8.2.4 How to anonymise or pseudonymise?

Dataset with only direct identifiers

Anonymise (See Table 2 of annex section)

- **Strip data of direct identifiers** (name, address, phone number, email address, etc). (See Table 5)
    - Direct identifiers are removed (e.g. omit columns in Excel).
      or
    - Direct identifiers are masked: completely or partially overwrite with (*/x)
      or
    - A random code is given to each data subject. E.g. Farmer51, Farmer07, Farmer04, ...

  or

- **Aggregate data** (e.g. average, sum, ...). Never figures from less than 5 farms. (See Table 6)

- Raw dataset to be deleted.

Pseudonymisation (See Table 2 of annex section)

- Direct identifiers (name, address, phone number, email address, ...) from raw dataset are replaced by a **pseudonym** using:
    - Sequential counter: a sequential number (and possibly a prefix) is used as a pseudonym. E.g. farmer01, farmer02, farmer03, ... (See Table 4)
      or
    - Random Number Generator: a random number (and possibly a prefix) is used as a pseudonym.
- Create **separate key file** containing a link between analysis data and personal data based on pseudonym. (See Table 3 of annex section)
- The raw dataset is preferably deleted (or has severely restricted access). The researcher preferably performs analyses on the pseudonymised data (= analysis data). The analysis data are restricted to authorised researchers who need the data to conduct the study for which the data were obtained. The key file has highly restricted access (= identifying data).
- At the end of the study - e.g. if pseudonymised data should not be kept as part of follow-up research - it is easy to anonymise the pseudonymised data. Change the pseudonym by a random

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code and permanently delete the raw dataset - if not already done - and the key file. (See Table 5)

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Table 1: Raw data

Names farmers	Email address	Housing type Eastern bunnies	Average number of Easter eggs per Easter bunny per year
Noah Peeters	n.peeters@telehoo.com	Enriched cage	461
Arthur Janssens	ajanssens@yanet.com	Outdoor system	409
Louis Maes	L2Maes@ghoo.com	Outdoor system	380
Olivia Jacobs	Oli.jacobes@yamail.com	Vrije uitloop	355
Emma Willems	emmaW@gtele.com	Vrije uitloop	340
Louise Dubois	Ldubois@telemail.com	Enriched cage	392
…	…	…	

Table 2: Key file (= identification details)

Pseudonym	*Names farmers*	*Email address*
Farmer01	Noah Peeters	n.peeters@telehoo.com
Farmer02	Arthur Janssens	ajanssens@yanet.com
Farmer03	Louis Maes	L2Maes@ghoo.com
Farmer04	Olivia Jacobs	Oli.jacobes@yamail.com
Farmer05	Emma Willems	emmaW@gtele.com
Farmer06	Louise Dubois	Ldubois@telemail.com
…	…	…

Table 3: Pseudonymised data (=analysis data). Based on pseudonym and key file, the farmer can be re-identified

Pseudonym	Housing type Eastern bunnies	Average number of Easter eggs per Easter bunny per year
Farmer01	Enriched cage	461
Farmer02	Outdoor system	409
Farmer03	Outdoor system	380
Farmer04	Organic system	355
Farmer05	Organic system	340
Farmer06	Enriched cage	392
…	…	

Random code	Housing type Eastern bunnies	Average number of Easter eggs per Easter bunny per year
Farmer51	Enriched cage	461
Farmer07	Outdoor system	409

Dataset with direct and indirect identifiers

Anonymise

Removing identifiers from data

- Identifiers are **removed** (e.g. omit columns in Excel).
  or
- Identifiers are **masked**: overwrite fully or partially with '*' or 'X'.
  or
- A **random code** is given to each person involved. (E.g. Farmer51, Farmer07, Farmer04, ...)

Or

- **Generalising** data: here, the data become less precise, specific to the intended purpose of scientific research. If there is too much loss of information in function of intended purpose, then anonymising is not the appropriate security measure and you should pseudonymise the dataset. For example:
  - Replacing a year of birth with an age or age range
  - Replace a location (e.g. municipality business seat) with a less precise location (e.g. province, agricultural region, ... business seat)
  - Replacing a specific farm type (e.g. specialised greenhouse vegetable farms) with a less specific farm type (e.g. specialised horticultural farm)

  Or
- Setting **upper and lower limits:** group values of data above or below certain limits to avoid that data subjects can be identified based on outliers. For example
  - Age range: '65 years and above' and the age range: 'less than 35 years'
  - Class of business size of '<25,000 euros' and business size of '>=500,000 euros'

  Or
- **Data perturbation:** rounding, adding noise, replacing real values with simulation values or group averages rounding numeric values and dates. The degree of value change determines anonymisation. When data accuracy is essential, data perturbation should not be applied.
  Or
- **Aggregate** data (average, sum, ...). Never figures from less than 5 companies.

The raw dataset are removed.

To verify that qualitative data has been properly anonymised, you can e.g. read the anonymous report from the data subject's point of view or have the anonymous report read by the data subject. If there are no more links to the data subject, the GDPR no longer applies.

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Pseudonymisation

- **Direct identifiers** (name, address, phone number, email address, ...) from raw dataset **are replaced by a pseudonym**.
- Create a separate key file containing a link between analysis data and personal data based on the pseudonym.
- As a function of intended purpose of scientific research
    - **Separate indirect identifiers from analysis data** and add to the key file or
    - **Do not separate indirect identifiers from analysis data** because they are of necessary importance for the analysis of the dataset and in consideration of the intended purpose:
        - **Generalise**: in this process, the data become less precise, specific. (Possibly not desired in the context of research.) For example:
            - ✓ Replacing a date of birth with an age or age range
            - ✓ Replacing an address of place of business with a less specific location: e.g. municipality or province or agricultural region, ... in which the place of business is located
            - ✓ Replacing a specific farm type (e.g. specialised greenhouse vegetable farms) with a less specific farm type (e.g. specialised horticultural farm)

          Or
        - **Setting upper and lower limits**: group values of data above or below certain limits to avoid that data subjects can be identified based on outliers. (May not be desirable in the context of research.) For example:
            - ✓ Age class: '65 years and above' and the age class: 'less than 35 years'
            - ✓ Class business size of '<25,000 euros' and business size of '>=500,000 euros'
        - **Data perturbation:** rounding, adding noise, replacing real values with simulation values or group averaging rounding numeric values and dates. When data accuracy is essential, perturbation should not be applied.
- When pseudonymising/anonymising transcripts, the above techniques can also be used. Substitutions can be indicated with square brackets e.g. [Farmer01] has a specialised Easter bunny farm in [Limburg] and says that keeping Easter bunnies in free range is better for animal welfare. [Farmer02] has a specialised Easter bunny farm in [West Flanders] and says that keeping Easter bunnies in enriched cage is less labour intensive.
- The raw dataset is preferably deleted (or has severely restricted access). The researcher preferably performs analyses on the pseudonymised data (= analysis data). The analysis data are

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restricted to authorised researchers who need the data to conduct the study for which the data were obtained. The key file has highly restricted access (= identifying data).

- At the end of the study - e.g. if pseudonymised data should not be kept in the context of follow-up research - you can consider - if possible/if desirable - anonymising the pseudonymised data. From the point of view of the data subject, consider whether the data subject is re-identifiable from the pseudonymised data.
    - If re-identifiable, the dataset is not sufficiently pseudonymised. GDPR legislation continues to apply. Data must be deleted at the end of the study, unless the data subject has given permission for the personal data to be retained for possible follow-up research.
    - If not re-identifiable, then the dataset is sufficiently pseudonymised. Change the pseudonym by a random code. Permanently delete the raw dataset - if not already done - and the key file. The GDPR legislation no longer applies to anonymous data. The anonymised data may be retained for follow-up research but can no longer be linked to specific individuals/firms. Longitudinal research at company level is therefore not possible with anonymised data.

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8.3 Annex 3: Template information sheet and informed consent

Template: Information Sheet for BREADCRUMB

This is a template for informed consent when collecting and processing personal data in BREADCRUMB. It can be used for surveys, observation, interviews, sound recording, etc. When you provide your own text, please, use clear and simple language, headings, and bullet points, active (not passive) language, and avoid foreign words.

Please change all text market in yellow.

INFORMATION SHEET

Dear participant,

You are invited to voluntarily participate in BREADCRUMB's research activity, **"Generating estimates of food waste caused by food marketing standards in different food commodities on a local level".** Before you agree to participate in this study, it is important that you read this information form carefully. If anything is not clear, please do not hesitate to ask questions, contact information can be found at the bottom of this document.

Purpose of the project

BREADCRUMB aims to provide an empirical evidence-based understanding and purpose of food marketing standards, along with their influence on the generation of food waste (FW). Its goal is to suggest interventions that strike a balance between the aim of FW reduction and other standards-related objectives, while assisting food chain participants in maximizing the commercial viability of less-than-optimal food products.

To achieve these goals, the project will address 16 case studies in five different food commodities (fruit & vegetable, meat, eggs, cereals, and fish).

Who is responsible for the research project?

ILVO is the responsible for project (i.e. the project coordinator).

What is the purpose of the research activity?

Our purpose with this interview is to gain more detailed information and deeper insight into food waste caused by food marketing standards for specific products (in (fruit & vegetable, meat, eggs, cereals, or fish) on local level.

To avoid information being lost during the interview, a sound recording of the interview will be made - if you agree to this. The sound recording will be erased within 3 months

Who is responsible for the data-collection in this research activity?

Breadcrumb has the following project partners VLTN, UNIBO, Natura Nuova, CREDA, UCPH, ITC, AINIA, CSCP, AVEC, Vila natura, Zelena Tocka, Anecoop, LF, Lehman Natur, FEBEV, FENEVIAN, PNO, MC and Mensana.

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[insert name of the institution responsible for the data collection for this interview/survey] is responsible for the data collection in this research activity. Contact details can be found on the last page of this document.

Why are you being asked to participate?

The population consists of stakeholders working in different stages of the food supply chain, relevant to the study of fruit and vegetable, such as farming, processing, distribution, retail or consumption/food service. Subjects have relevant experience or knowledge that can contribute to the understanding of food marketing standards and the impact of food waste in fruit and vegetables. We used a combination of snowball sampling and desktop research to recruit participants.

What does participation involve for you?

If you chose to take part in the research activity, this will involve that you answer to some questions of an interview. Your participation is expected to last approximately 90minutes. The interview includes questions about the food waste, different aspects of food marketing standards and the relationship between food waste and food marketing standards. Your answers will be recorded using sound recording.

In case translation between different languages is needed, the interview may last a little longer. If you permit, the interview will be recorded. If you are not comfortable with sound recording, detailed notes will be taken.

Potential benefits or risks of participation

Your involvement contributes to advancing scientific understanding, developing evidence-based solutions to combat food waste, and benefiting society. There are no direct benefits from your participation and there are no foreseeable risks in the participation.

Participation is voluntary

Your participation is completely voluntary. You have the right to refuse to answer any questions you are uncomfortable with or to skip any sections. If you chose to participate, you can withdraw your consent at any time without giving a reason. There will be no negative consequences for you if you chose not to participate or later decide to withdraw. If you do not wish to continue participating, you will be given the choice of having the data already collected erased or give your consent to the researcher to continue processing the results already acquired from the research However, deleting your data is no longer possible once the data has been anonymised, as anonymous data cannot be traced back to you.

Confidentiality & Privacy

Your identity and responses will remain confidential. Any personal data obtained will be handled securely. It will not be disclosed to anyone outside of the BREADCRUMB research team without your explicit consent. Only the involved researchers and authorized personnel from their own institutions will have access to the research data collected during the study. Partners of the project will have access to the anonymised data. The research results and analysis will only ever be communicated in *anonymised* form and be made available to the public via the website of BREADCRUMB, relevant publications, or other exploitation outcomes of the project. We will use your personal data only for the purpose(s) specified in this information letter.

The project will end in December 2026. All personal data will be stored only for the minimum period required to complete the research activities, which is foreseen 2 years after the project end, and in accordance with the accounting rules that apply under Horizon 2020, no longer than five years from the end of the project, when it will be deleted.

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In accordance with the General Data Protection Regulation (GDPR), your privacy will be respected. As already indicated, you may withdraw your consent at any time and without giving any reason. This means that your data will not be further processed from the moment of withdrawal.

You have the right to access the data collected about you and may also request a copy, if this does not infringe the rights and freedoms of others. Any incorrect data about you may be corrected at your request. Furthermore, you have the right to be forgotten this means that, after withdrawing your consent, you may ask for your personal data to be deleted. However, deleting your data is no longer possible once the data has been anonymised, as anonymous data cannot be traced back to you.

What gives us the right to process your personal data?

We will process your personal data based on your consent.

Contact information

If you have questions or concerns about the project BREADCRUMB, or want to exercise your rights, contact our Data Protection Officer: [insert name of the data protection officer at the institution responsible for the data collection]

Kind regards,

Responsible for data collection (DPO)

[Signature]

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CONSENT FORM

Selecting “I Agree” below indicates that:

- You have received and read the information in the BREADCRUMB Information sheet;
- You approve that the data or information you have provided can be shared and analysed for research purposes;
- You understand the procedures described above and the expected duration of the storage of the data;
- You have been given the opportunity to ask questions;
- You voluntarily agree to participate, and you are free to withdraw at any time without giving a reason and without consequences;
- You understand that your personal information will be treated and handled in accordance with the provisions of the EU General Data Protection Regulation (Reg. 2016/679);
- You are at least 18 years of age.

o I Agree

Participant's Signature: _____ Date: _____

Researcher's Signature: _____ Date: _____

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8.4 Annex 4: Template for an approval of ComESSH from EV ILVO

Template for an approval by Committee for Ethics in Social Science and Humanities (ComESSH) from Flanders Research Institute for Agriculture, Fisheries and Food (ILVO)

Read carefully the following documents. Please complete this document as detailed and specifically as possible. Add your informed consent and information sheet. When available, add your project proposal/description. When necessary, add other relevant documents

Sign this document and send all documents electronically to: Fleur.Marchand@ilvo.vlaanderen.be and Dakerlia.Claeys@ilvo.vlaanderen.be

General project information

1) Project title
2) Start date project
3) End data project
4) Name and email of the researchers
5) Involved ILVO unit(s)
6) External partner(s)
7) Financer(s)

Rationale

8) Provide a brief description of the research project. Explain the background and scientific relevance of the planned research. Explain the aims and objectives of the research project.
9) Reflect on why the chosen data collection is the best method of data collection.

Human participation

-> Study population

10) Who do you intend to recruit? List details on inclusion and exclusion criteria (eg age, specific characteristics, …).
11) What is the expected number of participants? How does this sample compare to the relevant population?

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12) How will participants be selected, recruited? (eg who will recruit, how (email, flyer, …), where and by whom participants will be approached for inclusion and obtainment of informed consent).

-> Informed consent

13) Which information is given to the participants about the aims and practical aspects of the research, interview, focus group, …? Include your information sheet. If no written information sheet is provided, please explain why.

14) When and how are participants asked for informed consent? Include your informed consent form. If written permission is not possible, please explain why.

-> Compensation and information

15) Are the participants compensated for their participation? If yes, please specify how this is done?

16) Will participants be informed about the results of the research project? If so, how?

Handling of (personal) data

17) Which information is collected about the participants? To which information class(es) (1-5) do the collected data belong? Include your survey, interview guide, …

For more info see: https://ilvo.vlaanderen.be/uploads/documents/privacy/dataclassificatie/Vo-informatieclassificatie-GDPR-Definitie-van-de-standaard-data-types-persoonsgegevens.pdf).

18) Are audio and/or video recordings made?

19) Is all processed data adequate, relevant and limited to the purposes of the project ('data minimisation' principle)?

For more info see: GDPR - Decision tree | reviewed (europa.eu)

20) How is the confidentiality of the data ensured? Are anonymization or pseudonymization techniques used? If yes, explain. If not, justify why personal data will not be anonymised/ pseudonymised. Is any other privacy-enhancing technology used?

21) Where will digital data (raw data, audio and videorecordings, …) be processed and stored?

22) Where will paper data be stored?

23) Who will have access to participants (personal) data during/after the research project? Will the collected personal data be passed on/shared with persons/organisations outside ILVO?

24) For how long will personal data be stored?

Vulnerable participants

25) Are **vulnerable participants** involved (eg. children/minors, people with cognitive impairments, refugees, irregular migrants, sex workers, dissidents, traumatised people at risk of re-traumatisation, people in dependent relationships with the researcher or the research team (eg student doing course work with researchers), persons unable to give consent, …)?

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If yes, give details about the type of vulnerability and justify why vulnerable participants are involved. Explain why alternative approaches are not possible (if they are not). Identify the risks, and show how you plan to mitigate and manage the risks. Show how you will ensure participants are not subject to any form of coercion and undue inducement.

26) Are they **children/ minors**?
If yes, give details on the age range. Provide details on assent procedures and parental consent for children / minors. Show how you will ensure the welfare of the chμildren/minors.

Sites of research

27) Is your research conducted in **contexts and geographical areas** where the conditions for research work may be **risky as regards the safety of participants, researchers** themselves? E.g.
- conflict regions,
- sites of historical value to indigenous people,
- troubled neighborhoods,
- non-EU countries or regions within them where the economic, political, environmental and health conditions may pose risk.

If yes, justify why you are choosing for an approach that involves higher risk. Explain why alternative approaches are not possible (if they are not). Identify the risks, and show how you plan to mitigate and manage the risks.

28) Is your research involving **sensitive areas of research**, which can be a risk of exposure to harm participants, researchers? E.g.
- research involving sensitive topics and those which might cause psychological stress, anxiety or humiliations;
- research involving potentially sensitive topics, such as: participants' sexual behavior; illegal or political behavior;
- experience of violence, abuse or exploitation; mental health; participants' personal or family lives; or their gender or ethnic status;
- Research into criminal activity.

If yes, justify why you are choosing for an approach that involves higher risk. Explain why alternative approaches are not possible (if they are not). Identify the risks, and show how you plan to mitigate and manage the risks

Handling of personal data with higher risk

-> special categories of personal data?

29) Are you processing special categories of personal data (=sensitive data) ? Eg

- Collecting data on racial or ethnic origin, political opinions, religious or philosophical beliefs;
- Collecting data on genetic, biometric or health data;
- Collecting data on sex life or sexual orientation;
- Collecting data on trade union membership.

If yes, justify for the processing of special categories of personal data (if relevant) and justify to why the project objectives cannot be reached by processing anonymized / pseudonymized data (if applicable). Analyse the potential risks to the rights and freedoms of research participants/data subjects and describe the measures that will be implemented to mitigate these risks. Check if special derogations pertaining to the rights of data subjects or the processing of genetic, biometric and/or health data have been established under the national law and submit declaration of compliance.

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-> data processing techniques which can be invasive?

30) Does your activity involve privacy-intrusive techniques or technologies? Eg covert observation, surveillance, tracking or deception of individuals); the use of camera systems to monitor behaviour or record sensitive information; "data-mining" (including data collected from social media networks), "web-crawling" or "social network analysis"; the profiling of individuals or groups (particularly behavioural or psychological profiling); the use of "artificial intelligence" to analyse personal data; or the use of automated decision-making which has a significant impact on the data subjects

If yes,

- Details of the methods used for tracking, surveillance or observation of participants (if relevant).
- Details of the methods used for profiling (if relevant).
- Assessment of the ethics risks related to the data processing operations.
- Explanation as to how the rights and freedoms of the participants/data subjects will be safeguarded and harm will be prevented.
- Explanation as to how the data subjects will be informed of the existence of the profiling, its possible consequences and how their fundamental rights will be safeguarded
- Check whether you are required to conduct a DPIA (Data protection Impact Assessment)

-> processing previously collected or 'open' personal data?

31) Does your research involve the processing of previously collected or publicly available data (including use of pre-existing data sets or sources, merging existing data sets? If yes,
    - Provide explicit confirmation that the data used in the project are publicly available and can freely used for the purposes of the project
    - Provide permission by the owner/manager of the datasets (e.g. social media databases) (if relevant).
    - Check if your intended use of the data conforms to any terms and conditions published by the data controller.

-> involvement of non-EU countries?

= Collecting data outside the EU or transferring personal data collected in the EU to entities in non-EU countries

32) Is it planned to export personal data (data transfer) from the EU to non-EU countries, not recognised as providing adequate level of protection? If yes, specify details of the types of personal data and countries involved and explain how the rights and freedoms of the participants/data subjects will be safeguarded. Provide the data processing agreements on the data transfers.

33) Is it planned to import personal data (data transfer) from non-EU countries into the EU or from a non-EU country to another non-EU country? If yes, specify details of the types of personal data and countries involved. Identify any further data protection requirements in applicable laws in the country in which data are to be collected and explain in your proposal how you will comply with them. Provide the data processing agreements on the data transfers.

Misuse of research

34) Is there potential of misuse of findings? Eg
    - Could the materials/methods/technologies and knowledge concerned harm people, animals or the environment if modified or enhanced?

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- What would happen if they ended up in the wrong hands, e.g. among criminals or terrorists, or were used to curtail human rights or civil liberties?
- Could they serve any purposes other than the intended ones? If so, would that be unethical?

If yes,

- provide a risk assessment, detailing the risks and how they will be mitigated in order to prevent misuse.
- provide a risk mitigation strategy

Other ethics issues?

35) Are there any other ethics issues that should be taken into consideration? Please specify and explain how you are going to mitigate the related risks?

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