Building a consumer data platform to enhance interdisciplinary research on **food, nutrition, and health** in Europe

**RICHFIELDS** – Research infrastructure on consumer health and food intake using e-science with linked data

in partnership with

**FNH-RI** – Food, Nutrition and Health Research Infrastructure

www.richfields.eu

www.wur.eu/fnhri
ABOUT RICHFIELDS

WHAT? RICHFIELDS is a three-year project that aimed to design a data platform for scientists, businesses, policymakers and people to connect and share information about consumers’ food behaviours. This leaflet illustrates the outcomes of the project and its role in the building of the first Research Infrastructure on Food, Nutrition and Health (FNH-RI) in Europe.

WHY? Every day, consumers, researchers and businesses generate “big data” that offer detailed descriptions of people’s behaviours. By linking and analysing these data-rich sources, researchers may be able to explain societal challenges regarding food and health, like obesity, cardiovascular disease and sustainability.

HOW? New ICT technologies bring opportunities for researchers to monitor and collect information on consumers’ behaviours. If these data-rich sources could be all linked and stored in one place, they would enable researchers to collect different types of information such as:

- How consumers purchase, prepare and consume food
- Business, existing research infrastructures
- ICT, business model, governance, ethics

PHASE 1
Mapping data generated by consumers
- Purchase, preparation, consumption

PHASE 2
Connecting business and research generated data
- Business, existing research infrastructures

PHASE 3
Design of the research infrastructure
- Aspiring member states
- Associated member states
- Interested member states
- Lead member states

WHAT ARE RESEARCH INFRASTRUCTURES (RI)?

RIs are facilities, resources or services which support the scientific community to conduct top-level research. Examples of RIs are CERN, the Hubble telescope, and the European clinical research infrastructure network (ECRIN). RIs facilitate harmonisation of data and help researchers to:

- Build bridges between national research communities and scientific disciplines.
- Connect research, education and innovation.
- Shape scientific communities.
- Attract young people to science.

ABOUT FNH-RI

WHAT? The Food, Nutrition and Health Research Infrastructure is a joint initiative involving 10 EU Member States who work closely together in the food and health domain to collect and assemble data, tools and services on food, nutrition and health. Resources are scattered across the globe in different formats and different languages.

WHY? It has become increasingly difficult for researchers to obtain data, tools, and services on food, nutrition and health. Resources are scattered across the globe in different formats and different languages.

HOW? The FNH-RI builds on the roadmap developed by the EU project EuroDISH and the recommendations of the European Strategy Forum on Research Infrastructures for a food and health research infrastructure (ESFRI). By 2024, FNH-RI plans to be fully operational and will bring together several RIs resulting from previous EU projects like EuroFIR, NuGO, GloboDiet, ISEKI-Food, Food4me, Quisper and ongoing EU-funded projects like IFAM, REFRESH, SUSFANS and RICHFIELDS. FNH-RI will enable top-level research, breakthroughs and innovations to make diets healthier and more sustainable. One of the building blocks of FNH-RI will be the Consumer Data Platform, designed in RICHFIELDS.
To support the design, RICHFIELDS has developed a ‘Core Offering’ summarising the content of the platform, and has mapped the development of the platform to maturity.

### Phase 1: How to Map and Store Data

An inventory management system (RIMS) has been created for storage and assessment of online tools (e.g., mobile phone applications), which produce consumer generated food and beverage purchase, preparation or consumption data. It contains two parts:

- A typology categorising the purpose of the tools.
- Metadata to enable assessment of data quality, either related to a scientific case or whether the data are FAIR - Findable, Accessible, Inter-operable or Re-useable (e.g. legal, governance or technical management constraints of the data).

### Phase 2: How to Link Data

Researchers conducted 10 case studies to investigate the technical components, interfaces and services necessary for data to be linked through the platform.

- Business generated data on purchase and procurement. (3 case studies)
- Existing or future resources regarding food composition and intake surveys, clinical interventions, consumer diet, health and lifestyle. (4 case studies)
- Laboratories and facilities that undertake consumer research on food choice, purchase, and consumption. (3 case studies)

### Phase 3: Designing the Platform

The needs of the research data platform have been designed to explore and exploit consumer generated data. The design includes the technical backbone, a business model and the internal and external governance.

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**Website Portal to access Data Platform**

(access subject to appropriate permissions)

**Authoritative Materials and Standards**

- Data catalogues and data management protocols
- Research protocols
- Standardised vocabulary/thesauri
- Ontologies/Semantic data models
- Training/Consultancy services

**Data Platform/Technology**

- Consumers
- Private data (Food, business, etc.)
- Public data (Public RIs, academic research data)
- Hard infrastructure linkages to experimental facilities (Labs, virtual supermarkets, etc.)
- Apps (Private or public/private)

**RICHFIELDS Data Platform**

Data storage, data linkage and search capabilities; calibration and knowledge generation tools

**Governance Structures**

- Management/Steering committee
- User and Stakeholder network/forums
- Conferences/wider dissemination
THREE STEPS TO DESIGN THE PLATFORM

Data combination and management focuses on the physical infrastructure, software, and potential data access and exchange. Hence concepts such as open and big data, and standards to link data from different sources are addressed.

Sustainable business models allow the data platform to be self-sustaining, ensuring value for all stakeholders as well as defining the services that would be provided, the supply chain, and the revenue model.

The needs of users and data providers as well Intellectual Property Rights (IPR) and ethical constraints are core elements of the governance framework, which must consider privacy, ownership, (inter-)national regulations, standardisation, and quality management.

FNH-RI WILL UNDERPIN THE DESIGN OF OUR PLATE OF THE FUTURE

Maturity
fully operational Data Platform aligning and sharing consumer, business and research data

Growth
extended set of data users, data providers and services

Core Offering
starting point for the establishment of a Minimum Viable Product (MVP) and Minimum Viable Ecosystem (MVE)

WHO WILL USE THE PLATFORM?
- Researchers
- Policy makers
- Businesses
- Consumers

THREE ELEMENTS OF THE FINAL PLATFORM DESIGN

SEMANTIC MODEL
- to encode data and information to enable sharing of data with end-users or information systems. RICHFIELDS has also generated an ontology to aid re-use and integration of data, information, and knowledge.

BUSINESS MODELS
- potential business models, depending on the value proposition, supply chain configuration and revenue system, have been explored for future implementation.

GOVERNANCE MODEL
- includes issues related to FAIR data, such as data ownership, privacy, IPR, and ethics, all of which have been considered in the design.

ULTIMATE GOALS OF THE RI
- INCREASE THE SUSTAINABILITY OF FOOD PRODUCTION
- HELP PEOPLE EAT HEALTHY DIETS
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