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Executive Summary

RICHFIELDS aims to publish the design for a consumer data platform that will collect and/ or connect information about food behaviours from a variety of sources (e.g. consumers, business and research). The project seeks to determine which facilities, resources and services can support research around what we choose to eat (purchase, preparation and consumption), and how and why we make these choices. Phase 1 of the project created an inventory management system for assessment of online tools (e.g., mobile phone applications), which produce consumer and research-generated food and/ or beverage purchase, preparation or consumption data, comprised of a typology categorising the purpose of tools and metadata enabling assessment of data quality. Phase 2 took a more detailed approach, investigating technical components, interfaces and services necessary for data to be linked to create a functioning RICHFIELDS platform, using a range of case studies. Phase 3 is developing the architecture and governance structure for the platform, including business models that outline potential services.

An on-going aspect in the design has been user and provider requirements, which have been characterised to ensure the platform is fit for purpose. Scope and needs have been explored in a wide range of different activities across several work packages (e.g. WP3 Stakeholders' workshops). It was apparent from the first stakeholder workshop (Amsterdam Schiphol – NL, 27th September 2016) that the vision for RICHFIELDS, specifically what would be offered in terms of tools and services, was difficult for to visualise and, thus, the objective of the second workshop (Penta Hotel City Centre Brussels – BE, 4th April 2017) was to invite stakeholder input on the core offering at the minimum viable product level as well as motivators and barriers to collaboration or exploitation of RICHFIELDS data and services.

The objectives of this workshop (3) were to invite external stakeholder input on the vision of RICHFIELDS (December 2017) compared with the scientific aims (October 2015) and, more specifically, the scope for using consumer-, research- and business-generated data to understand food behaviours better. During the parallel sessions, aspects including customer needs and platform design were discussed in detail. Further, because the consumer data platform does not exist in isolation, the wider demands for the food, nutrition and health research infrastructure was considered in parallel.

To help Phase 3 deliver the design, delegates were also asked to consider, individually and as a group, before and after the workshop, typical users and how they might use the platform data as well as whether the consumer data platform would be useful for them and their organisations. This also enabled some comparison of views, before and after the event, with beneficiaries' user stories from the M26 consortium meeting (Lyon – FR, 21st-23rd November 2017). Overall, we received insightful feedback from the delegates during the plenary and parallel working group sessions, which are being used to inform development of the RICHFIELDS consumer data platform design, governance and business model(s).

Other key points identified from this workshop were:

- Delegates and beneficiaries identified similar potential users of the consumer data platform and reasons why users might access platform data, i.e. access to up-to-date/ real-time, high-quality, well-described diet and health data
- Whilst researchers were recognised as the primary users of both the consumer data platform and the FNH-RI, policy-makers including public health, healthcare professionals and allied

service, and others (e.g. science journalists) were also identified as benefiting from access to better data as well as consumers (personalised advice).

- Scope in terms of perceived needs and gaps in existing information was much broader than RICHFIELDS (purchase, preparation and consumption), suggesting stakeholders' requirements are more in line with the food, nutrition and health research infrastructure (FNH-RI)
- Almost without exception, the principal role of the consumer data platform and/ or FNH-RI was described not just as providing access to data, but also support in (a) selection of the appropriate data, (b) interrogating data correctly, and (c) generating publication-ready reports, which – again – is more appropriate for a research infrastructure, such as FNH-RI.

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1. RICHFIELDS Background¹

1.1 RICHFIELDS project objectives

RICHFIELDS aims to publish the design for a consumer data platform to collect and connect, compare and share information about our food behaviours. The project seeks to determine which facilities, resources, and services could support research activities to learn more about what we choose to eat, and how and why we make those choices. It is also exploring the integration of data on food purchase, food preparation and food consumption, generated from different sources:

- Consumers (e.g. apps, sensors)
- Business (including retail, e-commerce e.g. sales)
- Research (including European and International research, e.g. surveillance data)

A business model will outline services provided by the RICHFIELDS consumer data platform, and how these will generate revenue to sustain it in the longer-term, while a roadmap will outline the steps needed to introduce a platform that can serve the whole of Europe.

1.2 Wider scientific landscape: European food, nutrition and health research infrastructure

Many of the challenges undermining food (including nutrition) and health are inherently interdisciplinary and multi-sector. The European Union (EU) has a strong track record of coordination amongst Member State (MS) research providers and users, and an important role in delivering research and demonstrating international leadership in innovation for economic and societal benefits through sustainable economic growth and employment, and enhanced health and well-being.

The EU has launched several programmes to encourage joint agenda setting, including development of RIs and collaboration, but there has been growing concern over the lack of RIs able to support the study of food systems, including nutrition, maintenance of health and healthy ageing, and command critical mass (users and providers) since the European Research Infrastructure Landscape (MERIL - <http://bit.ly/228cEfs>) was first mapped in 2010-2012. FAHRE (FP7) mapped European research systems, describing existing structures, and identified gaps and needs for future food and health research (<http://bit.ly/1QR9dmg>; McCarthy et al. 2013 10.1016/j.foodpol.2012.12.005) and concluded that better research collaboration and innovation across Europe are essential to improve the efficiency of mainly public research resources and leverage competitive advantage globally.

EuroDISH identified the need for RIs in the food and health domain that could advance research within and across the so-called DISH domains, specifically determinants of dietary behaviour (D), intake of foods and components (I), status and function in the body (S), and health and disease risk (H). It also described needs and gaps in a conceptual design as well as a roadmap for implementation (Snoek et al., 2016 submitted). A notable finding was the highly variable nature of existing DISH resources, demonstrating both a practical and strategic need for RIs engaging stakeholders along the food chain.

¹ Sections 2-4 reflect the status quo in December 2017, i.e. as published for the third stakeholders' workshop

Stressing the need for world-class research infrastructures, EU Horizon 2020 has provided financial support for RICHFIELDS, which commenced on 1st October 2015 for three years, coordinated by LEI Wageningen UR (NL). Drivers for a consumer data platform considering determinants included:

Science case:

- More accurate and reliable insights in food intake
- Standardisation of measurements of determinant of food intake needed
- Integration of food intake with determinants needed: personal characteristics as well as contextual factors
- Personalised advice requires new approach

Data governance case:

- Data stewardship: open access, data procurement,
- Data sustainability: FAIR data
- Privacy and data security: new regulations
- Integrated data: from different sources such as consumer generated data, data generated by research, data generated by the private sector, data generated by health professionals
- Standardised data: standardised tools and methods to collect this data, enabling to align across countries

1.3 RICHFIELDS structure

Sixteen organisations from 12 countries have brought together competences including nutrition, sociology, information management, ICT, business, consumer science, and food processing.

The first two phases of RICHFIELDS (Phase 1 WP5-7; Phase 2: WP8-10) have delivered in-depth knowledge about the available consumer-related data and, based on these outputs, the future requirements for such a platform (design) are being developed (Phase 3: WP11-13) (Figure 1).

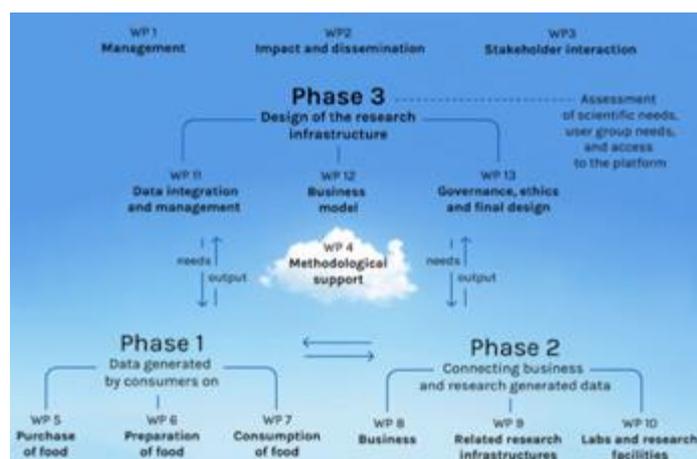


Figure 1. RICHFIELDS structure

1.4 Phases 1-2: Findings to date

1.4.1 Phase 1

An inventory management system (RIMS) has been created for storage and assessment of an online inventory of tools (e.g., mobile phone applications), which produce consumer generated food and/ or beverage purchase, preparation or consumption data. RIMS is comprised of two parts: (1) a typology categorising the purpose of tools and (2) metadata to enable assessment of data quality, either related to a scientific case (e.g. are the data sufficient to answer a what/ who/ why/ how/ where research question) or whether the data are findable, accessible, inter-operable or re-useable (e.g. legal, governance or technical data management constraints). Information about these is fundamental to developing the architecture and governance structure of the RICHFIELDS platform.

1.4.2 Phase 2

Case studies in work packages 8-10 have allowed a more detailed approach to investigate the technical components, interfaces and services necessary for data to be linked to create a functioning RICHFIELDS platform. These case studies include:

- Work package 8: Three case studies addressing business generated data on purchase and procurement: (i) Coop DK, (ii) Statistics DK, (iii) Göteborgs Stad SE
- Work package 9: Four case studies exploring the potential for delivering data and content to the RICHFIELDS platform from existing infrastructures or those currently under development: (i) food composition and food attributes (EuroFIR, FoodExplorer, ePlantlibra, Brandbank, FoodWiz); (ii) Standardised food intake from population-based surveys (Globodiet); (iii) Clinical interventions; and (iv) consumer diet, health and lifestyle (PRECIOUS, Quisper).
- Work package 10: Three case studies investigating laboratories and facilities that undertake consumer research on food choice, purchase and consumption: (i) the Fake Food Buffet at ETH Zurich (food choice); (ii) the FoodScape Lab at Aalborg University (food choice, consumption); (iii) Restaurant of the Future at Wageningen University (food choice, purchase and consumption).

1.4.3 Phase 3

WP11-13 have designed an open-access, distributed research data platform to empower state-of-the-art exploration and exploitation of consumer generated data. Whereas Phase 1 mapped the data at consumer level and Phase 2 investigated the interaction with existing RIs, business data sets and experimental labs, Phase 3 is designing governance, IPR and ethical aspects of the platform:

WP11 Data combining & management has focused on the physical infrastructure, software and potential data access and exchange, which has meant concepts as open and big data, and standards to link data from different sources are being addressed.

WP12 Business model is exploring sustainable business model(s) that would 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.

WP13 has considered the needs of users and data providers as well IPR and ethical constraints, as core elements of the governance framework, which must consider privacy, ownership, (inter-) national regulations, standardisation and quality management.

1.5 User requirements analysis

An on-going aspect of the design has been user and provider requirements. A series of activities have characterised RICHFIELDS end-users and stakeholder groups as well as identify end-user and stakeholder requirements to ensure the platform is fit for purpose, including these workshops. Outputs from this third workshop will be included in the final design for the RICHFIELDS platform.

1.6 Information architecture

To support discussions around design, content and supporting issues (e.g. governance), RICHFIELDS developed a 'Core Offering' summarising the potential content of the consumer data platform at the 'Minimum Viable Product' (MVP) level, which is more than a collection of potential resources.

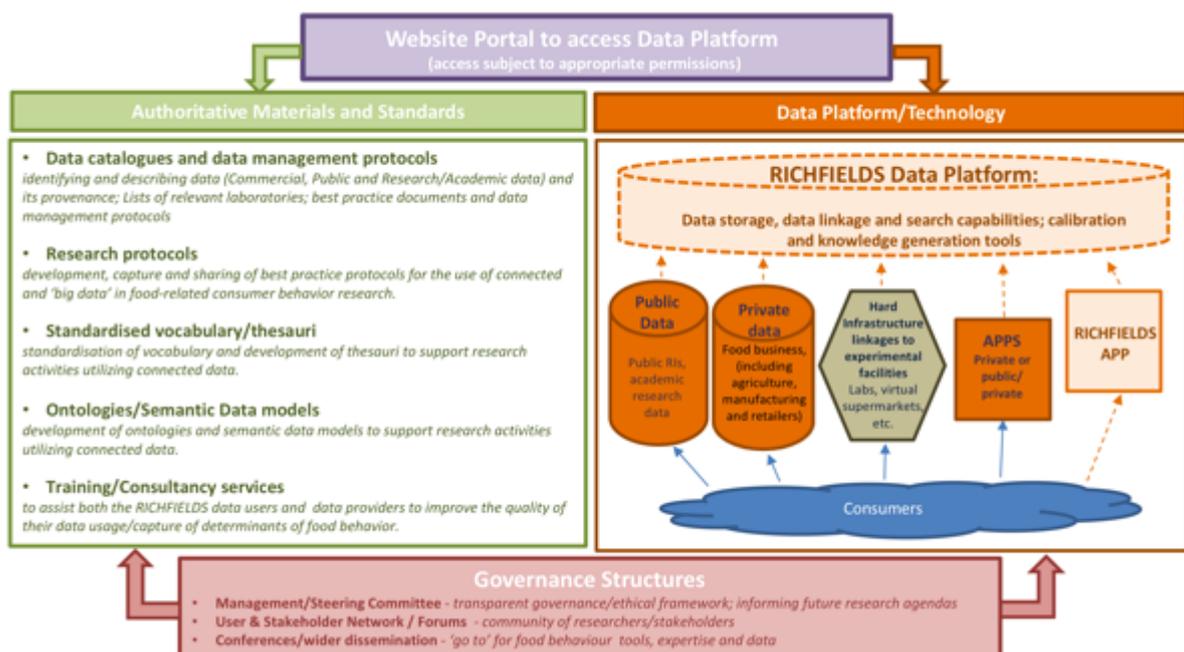


Figure 2: Core offering proposal (at MVP level) (30th November 2017)

1.7 RICHFIELDS final design

Together, Phase 3 is using the knowledge generated in Phases 1-2 as well as other activities to generate three elements of the final RICHFIELDS platform design:

- Semantic model - this is necessary to encode data and information and allow sharing (re-use) of data with end-users or information systems (software agents). Work package 11 has generated an ontology and set of classes to aid re-use and integration of data, information and knowledge.

- Business model - WP12 has produced different business models that are dependent on the value proposition (service offered), supply chain configuration (means to deliver services to users) and revenue system (remuneration mechanism for the platform).
- Governance model – will be depend on how governance is defined, i.e. which elements of governance will be included within the design of RICHFIELDS. Issues related to FAIR data, such as data ownership, privacy, intellectual property rights, and ethics will all need to be considered.

It is these issues that formed the core of discussions during the third Stakeholder workshop.

1.8 Food, Nutrition and Health Research Infrastructure

Based on the roadmap developed in EuroDISH (EU FP7; 2012-15 – www.eurodish.eu) and European Strategy Forum on Research Infrastructures (ESFRI) recommendations (2015), a Food, Nutrition and Health Research Infrastructure (FNH-RI) would bring together existing fragmented resources from previous EU-funded projects (e.g. EuroFIR, NuGO, GloboDiet, ISEKI-Food, Food4me, Quisper), on-going EU-funded projects (e.g. iFAAM, REFRESH, SUSFANS and RICHFIELDS), the Joint Programming Initiative Agriculture, Food Security and Climate Change (JPI-FACCE) and A Healthy Diet for a Healthy Life (JPI-HDHL with Knowledge Hubs DEDIPAC & ENPADASI).

The FNH-RI would support better scientific analysis and understanding of the relationships amongst the food supply chain, food innovation, determinants of behaviour around food (i.e. purchase and preparation), consumption, composition (nutrients and bioactives), nutritional status, functions and mechanisms leading to maintenance and promotion of healthy diets and lifestyles and prevention of disease and their breakdown as well as how these might be influenced by policy and industry.

The objectives of FNH-RI are to:

- Realise and sustain a European research infrastructure in the domain of food, nutrition security and health, which enhance collaboration and translation of know-how along the food chain and consumer including policy and civil society organisations
- Facilitate quality, cost effectiveness, and availability of resources in the research system, and enhance innovation capacity, integrate new knowledge, and deliver environmental and socially important innovations to address research challenges in food, nutrition and health research
- Bring together expertise across disciplines (trans-disciplinary approaches) and geographical borders (trans-national basis) to support scientific researchers in scientific institutes, civil and policy organisations and businesses and to foster top-level science, innovative research, industrial competitiveness and policies to achieve key societal targets

1.8.1 FNH-RI: Proposed timeline (w.e.f. 1st December 2017)

- Science case for FNH-RI was launched summer 2017
- Foundation formed in March 2017 that would memorandums of understandings (MoUs) with ELIXER and BBMR, and apply for an EU Personal Identification Code (PIC)
- MoU are pending with ELIXIR, BBMRI and ECRIN, and METROFOOD
- Five Member States are currently involved (DK, UK, IT, Slovakia and NL); two are included on national roadmaps for RIs (DK and NL); UK will apply for this status in 2017 and Italy in 2018
- New nodes are expected in 2017 (FR, IS, NO, SE, FI)

- Food businesses (2) and facilitators (3) will form a business platform within the FNH-RI
- Building blocks include: www.eudodisch.eu, www.richfields.eu, www.eurofir.com, www.dedipac.eu, www.enpadasie.eu, www.epic.iarc.fr
- Full application for the ESFRI roadmap is expected in 2019-2020

1.8.2 Potential impact of FNH-RI

European and global top-level research on food-nutrition-health: FNH-RI focuses on food and nutrition security as well as health, and governs data, tools and services to facilitate top level research on food chain, food behaviour and consumption, nutrition and health through data standardisation and harmonisation, interoperability and –management, e-interfaces, data access policy, ethical and IPR requirements and governance trans-disciplinary and trans-national. This fosters cooperation with aligned RIs as ELIXIR and BBMRI, and stimulate participation of third countries, e.g. Australia, Kenya and Ghana as food industry.

Addressing user needs: FNH-RI will enable researchers and other users to address key research challenges, encompassing the wider the food and health challenges security under framework research programmes as FOOD 2030 as well as helping to contributing to the proposed KICs, which will support research, training and entrepreneurship in Europe.

Paradigm shift in food research: FNH-RI will facilitate new data collection tools such as sensors and wearables to stimulate citizens' data collection and science through e-science, enabling datasets to be linked more readily. European citizen will be data providers and, excitingly, primary user, supported by a platform for researchers to generate new insights from the data.

2. Objective of the workshop

2.1 Aims of the workshop

The objectives of this workshop were to invite external stakeholder reflection and input on the vision of RICHFIELDS (December 2017) compared with the scientific aims (October 2015) and, more specifically, the scope for using consumer-, research- and business-generated data in terms of:

- Information technology requirements
- Ethical, legal and societal issues
- Innovation, citizen science and other breakthroughs
- Business models: value propositions, key suppliers and key activities

During the parallel sessions, aspects including customer needs and the provisional design were discussed in detail, enabling the provisional design to be updated, based on these requirements.

In addition, because the consumer data platform (RICHFIELDS) will not exist in isolation, the wider demands for the food, nutrition and health research infrastructure was considered in parallel.

2.2 Output of the workshop

The outputs are summarised in **Section 5: Results from the workshop** and detailed in **Annex 2: Workshop Programme** and **Annex 3: Rapporteur reporting** to inform future activities and development of the RICHFIELDS consumer data platform design, governance and business model(s).

In addition to the issues that each group discussed, to help Phase 3 deliver the design, delegates were also asked to consider the following, individually and as a group, before and after the workshop:

- Describe the typical consumer data platform (RICHFIELDS) user (individually)
- Describe the typical consumer data platform (RICHFIELDS) user (as a group)
e.g. A user would be < PhD student/ R&D researcher/ Policy-maker, etc. >
- Describe how you (individually) might use a consumer data platform (RICHFIELDS)
- Describe how you (group) might use a consumer data platform (RICHFIELDS)
i.e. As a < type of user >, I want < some goal > so that we can < some reason >

This enabled comparison of their views, before and after the event, as well as with user stories from the beneficiaries developed during the M26 consortium meeting (Lyon – FR, 21st-23rd November 2017).

3. Workshop methodology

3.1 Recruitment and participants

The aims of the first (Amsterdam Schiphol – NL, 27th September 2016) and second (Penta Hotel Brussels City Centre – BE, 4th April 2017) stakeholder workshops were to:

- Support the on-going work regarding requirements for specifying and characterising the wide range of datasets identified as providing information about consumer behaviour around food choices; and
- Invite stakeholders to reflect on and provide input regarding the RICHFIELDS scientific aims and vision, and work performed thus far, particularly the Core Offering Proposal at the Minimum Viable Product level and identify potential motivators and barriers to future collaboration

The aims of this workshop were to invite external stakeholder reflection and input on the vision of RICHFIELDS (December 2017) compared with the scientific aims (October 2015) and, more specifically, the scope for using consumer-, research- and business-generated data in terms of information technology requirements, governance including ethical, legal and societal issues, innovation, citizen science, and business models: value propositions, key suppliers and key activities.

Potential participants were selected from those invited to the first and second stakeholder workshops as well as the Stakeholder Platform (Penta City Centre Brussels – BE, 2nd June 2016), regardless of whether they could attend. This list was refined further by a small team comprising representatives from the Project Management Team (PMT), WP3 and WP4, and focussed on those from research and industry as data providers and users, and consumer representatives who are important partners in the development of appropriate governance for the platform. Invitees were also identified from the WP10 list of laboratories and facilitates that might be linked with the RICHFIELDS platform and the WP3 list of existing research infrastructures. Where possible, they were matched with beneficiaries from WPs 8-13.

Ultimately, 19 invitations were accepted by external participants and 19 RICHFIELDS beneficiaries attended (see Annex 1: Workshop attendance, A1.1 External participants and A1.2 RICHFIELDS beneficiaries for more details).

Stakeholders were assigned – based on their broad expertise – to one of four groups, namely (1) Technology, (2) Ethics & legal, (3) Research and (4) Business. Each group (ca. 8-10 individuals) was led by a facilitator from the consortium (Group 1: Technology – Tome Eftimov [JSI – SI]; Group 2: Ethics & legal – Javier de la Cueva [ES]; Group 3: Research – Bent Egberg Mikkelsen [AAU, DK] and Group 4: Business – Golboo Pourabdollahian [CNR, IT]) supported by either a member of the Project Advisory Board (Group 1: Technology – Fred van Alphen, Group 2: Ethics & legal – Wilke van Ansem) or individual identified from the external participants with a specific interest in the topic (Group 3: Research – Birdem Amoutzopoulos [MRC, UK], Group 4: Business – Luca Bucchini [Hylobates Consulting Srl, IT]).

The final groups were:

Group 1: Technology

- Tome Eftimov (JSI, SI - Lead, RICHFIELDS)
- Fred van Alphen (Consultant, NL - PAB RICHFIELDS)
- Angelika Mantur-Vierendeel (EuroFIR, BE - Dietitian, RICHFIELDS)
- Thomas Arnold (European Commission, BE - Research & Innovation, External)

- Karl Presser (ETHZ & Premotec, CH- CT business, External)
- Giulia Vilone (Creme Global, IE - ICT business, External)
- **Damian O'Kelly (Nutritics, IE- ICT business, External)²**
- Frankie Douglas (Nutritics, IE- ICT business, External)
- **Harry van Haften (the hyve, NL- ICT business, External)³**

Group 2: Ethics & legal

- Javier de la Cueva (Consultant, ES - Lead, RICHFIELDS)
- Wilke van Ansem (ZonMW, NL - PAB RICHFIELDS)
- Marc-Jeroen Bogaardt (WUR, NL - social research, RICHFIELDS)
- Charo Hodgkins (USurrey, UK - social research, RICHFIELDS)
- Maria Romeo-Velilla (EuroHealthNet, BE - non-profit health consumers, External)⁴
- Klazine van der Horst (Nestle, CH - Researcher, External)
- Maartje van den Berg (RaboResearch Food & Agribusiness, NL – Strategist, External)
- Siân Astley (EuroFIR, BE - Communications and researcher, RICHFIELDS)

Group 3: Research

- Bent Egberg Mikkelsen (AAU, DK - Lead, RICHFIELDS)
- Birdem Amoutzopoulos (MRC UK - Diet & health researcher, External)
- Karin Zimmermann (WUR, NL - Research programme manager in food and health, RICHFIELDS)
- Monique Raats (USurrey, UK- Research Director, RICHFIELDS)
- Nadia Slimani-Popovic (Independent, FR - food researcher, External)
- Maria Kapsokefalou (AUA, GR- food researcher, External)
- Vladimir Vietoris (Slovak University of Agriculture in Nitra, SK- food researcher, External)
- Aida Turrini (CREA, IT- statistician and food researcher, External)

Group 4: Business

- Golboo Pourabdollahian (CNR, IT- Lead, RICHFIELDS)
- Luca Bucchini (HYLO, IT – SME food research, External)
- Hennie van der Veen (WUR, NL - social researcher, RICHFIELDS)
- **Kerstin Lienemann (DIL, DE - agriculture and food researcher, RICHFIELDS)⁵**
- **Simon Haafs (i3B, NL - ICT Managing Director, External)⁶**
- Paolo Colombani (Consulting Colombani GmbH, CH - Sports nutrition and food research, External)
- Maria Glibetic (CAPNUTRA, RS – SME CEO & food researcher, External)
- Paul Finglas (QIB/ IFR, UK – SME President & food researcher, RICHFIELDS)

² Did not attend – no reason given

³ Did not attend due to travel disruption in the Netherlands

⁴ Did not attend – no reason given

⁵ Did not attend due to ill-health

⁶ Did not attend due to travel disruption in the Netherlands

3.2 Process and materials

Due to travel disruption and a power cut at the venue arising from bad weather, the agenda (A2.1 Workshop agenda [proposed]) was adapted, as indicated in A2.2 Workshop agenda (actual).

The groups were similarly adapted (see 4.1 Recruitment and participants) to allow for those who were unable to attend or late due to weather-related travel disruption (e.g. diversions or cancelled public transport) (also see A2.3 Sign-in sheets).

Following the welcome and introductory presentations (see A2.2 Presentations), the delegates moved to their groups for discussions (see Annex 3: Parallel working groups – Discussion and Feedback).

On day 2 (12/12/2017), after the morning breakout session, the leaders of each group offered feedback (Annex 3: Parallel working groups – Discussion and Feedback) and, following a short break, there was an open discussion, moderated by Paul Finglas (QIB, UK), which included feedback from every individual present (see Annex 4: Typical user of a consumer data platform), regarding RICHFIELDS and how their organisation might fit within the proposed FHN-RI (see Annex 5 Questions and Feedback, A5.2.1 Pre-event questions and A5.2.2 Post-event questions), which together could be compared with responses from the beneficiaries collected during the Consortium Meeting (Lyon – FR, 21st-23rd November 2017).

4. Results from the workshop

4.1 Workshop content and delivery

Mindful of feedback from the first (Amsterdam Schiphol – NL, 27th September 2016) and the second (Penta Hotel City Centre Brussels – BE, 4th April 2017) stakeholders' workshops, this workshop sought to encourage delegates to compare and contrast the vision for RICHFIELDS⁷ at the start (October 2015) and now (December 2017) and envisage for themselves the types of user and their needs, which might be addressed by a consumer data platform, focussing on determinants of food behaviours, specifically purchase, preparation and consumption. Thus, the programme (presentations and parallel sessions) were tailored to ensure that the attendees had sufficient information about the consumer data platform and FNH-RI concepts to facilitate understanding and expedite exploration of the scope for using consumer-, research- and business-generated data in terms of:

- Information technology requirements
- Ethical, legal and societal issues
- Innovation, citizen science and other breakthroughs
- Business models: value propositions, key suppliers and key activities

Overall, the approach was successful, and we received insightful comments and reflections from the delegates, both during the main plenary sessions and during the breakout session as well as responses to pre- and post- event questions (Annex 5 Questions and Feedback) about typical user and their needs and where their organisations might fit in terms of the wider FNH-RI. Although the delegates were asked to provide feedback on the organisation and delivery of the event, as with previously, in this case none was received. They were not asked again, after two reminders, on the basis that responses were positive for the first and second workshops, and delegates had replied to other pre- and post-event questionnaires.

4.2 Feedback from parallel working groups

4.2.1 Using consumer-, research- & business-generated data: Information technology requirements (Group 1: Tome Eftimov - JSI, SI) (see Annex 3, A3.1 for details)

The consumer data platform should be a proxy (virtual federated system) where data remain at their source, but can be accessed for interrogation and exploitation, as necessary.

As a user likely issues include:

- **Data quality:** Users will want high-quality data supported by meta information, but the capacity for a consumer data platform to deliver this depends on (a) quality of the data collected and (b) cooperation of the source (e.g. App developer) as well as consumers and the terms and conditions
- **Performance:** Users will have expectations in terms of how long it takes for data to be delivered. Depending on the complexity of searches, diversity and/ or volume can be challenging and RICHFIELDS will need to indicate estimated times for data requests, allowing users to refine searches for more rapid returns, or improve the infrastructure to reduce times.
- **Data access:** Users will want to either (a) save searches to return to the data for continued analysis or (b) download data locally for offline interrogation. RICHFIELDS must facilitate these.
- **Data enrichment:** User will want to enrich data, i.e. add other sources, include meta-data, etc., which RICHFIELDS must facilitate both in terms of data and tools for interrogation.

⁷ In this context, RICHFIELDS refers to the project whilst consumer data platform refers to the digit federated system

- **Energy:** Consumers and users are increasingly conscious of climate change, and computer systems are energy-hungry. RICHFIELDS must be able to demonstrate that the service and tools are environmentally-friendly (e.g. carbon-neutral or offer acceptable off-set) and minimises pollution (e.g. recycles equipment such as servers for trace metals).
- **User dashboard:** Users will have different skill levels in terms of data interrogation. The user interface (dashboard) must guide use, based on skills and knowledge of data selection through, for example, decision trees or simple question-to-query technology.
- **Data availability:** Users will want to know what they are able to access and the limitations of the data. RICHFIELDS must support this process through the dashboard and guidance documents and, for example, help desk support, which might need to be in several EU languages as well as English.

4.2.2 Ethical, legal and societal issues: Framework for practice (Group 2: Javier de la Cueva - Consultant, ES) (see Annex 3, A3.2 for details)

Issues that were discussed included (1) anonymisation/ privacy; (2) consent versus informed consent, especially with respect to re-purposing data that were originally added to an app (e.g. MyFitnessPal) and are now being used for research; (3) risk management (e.g. risk of a data breach, accidental revelation of information related to an individual's risk of disease, gatekeeping [i.e. information about an individual that is deduced based on professional knowledge], particularly in the absence of a mechanism for feedback) and what these issues mean for the RICHFIELDS governance model, the major concerns as a user (researcher, funding body, food industry) and a provider (app developer and consumer).

As a user, issues that were identified included:

- Privacy issues and ethical compliance
- How the cost model is implemented to ensure fair access
- Impact of the media on re-purposed data (i.e. fake news, original terms and conditions)
- Monitoring and prevention of data breaches
- Protection of intellectual property and whose (consumer, app developer, researcher)
- Data accessed via the consumer data platform are ethically-sourced for use in research
 - Funding bodies, publishing houses, etc. understand this to facilitate funding and publications

As a consumer, issues that were identified included:

- Privacy and anonymisation
- Transparency about how data are used and re-purposed
- Do not understand fully the value and potential impact of their data, which has implications for informed consent and vulnerable groups
- Protection from mis-use of data, i.e. consumer protection authority and judicial scope

What these mean for RICHFIELDS and consumer data platform governance model

- Processes and decisions must be transparency with appropriate oversight
- Guidelines have to be set with respect to what data can be used and for what; these guidelines will evolve with the platform
- Metadata should address IP, ownership and privacy
- Risk management and gate-keeping are fundamental elements of the governance model
- Private, public and common licenses are also elements of the governance model

- RICHFIELDS must consider public liability insurance
- There should be consumer representation within the management structure
- EU MS legislation needs to catch-up with protection from online data exploitation

4.2.3 Using consumer-, research- & business-generated data for research: Envisaging the future: Innovation, citizen science and other breakthroughs (Group3: Bent Egberg Mikkelsen - AAU, DK) (see Annex 3, A3.3 for details)

Issues that were discussed included what citizen-supported data share projects might look like in practice, how new digital devices for collecting consumer data can be co-created, how understanding food-related behaviours might be monitored in the real-world and capture decision-making as well as actions, and how this science can be communication to citizens. The five most important aspects of identified for success were being open with consumers, sharing information proactively, re-using existing data and resources, co-creating tools and services and using digital technology to link all the elements.

4.2.4 Business model of RICHFIELDS: value propositions, key suppliers and key activities (Group 4: Golboo PourAbdollahain - CNR, IT)(see Annex 3, A3.4 for details)

Issues that were discussed included the customers for consumer data platform (researchers, policy-makers, business [e.g. ICT developers] and, potentially, consumers).

The value propositions identified were:

- Access to aggregated high-quality integrated datasets that can be linked to proprietary information to other datasets and, thus, increase value of these data
- Being socially responsible
- Consultancy and data analysis
- Development of tools and services in line with agreed standards (quality mark)
- Networking and creation of new business opportunities
- Training services (how to use protocols, semantic data models, data analysis, methods)

The key activities identified for RICHFIELDS and design of the consumer data platform were:

- Collection and harmonisation protocols
- Communication and dissemination
- Consulting on quantitative
- Customer relationship management
- Data quality assessment
- Elaboration of thematic and/ or periodic reports
- Identification of valuable data sets and suppliers
- Legal and ethical best practice
- Negotiation with suppliers and development of contracts
- Running the platform efficient and effectively

However, it was agreed that many of these activities are highly ambitious, especially in the early development of the consumer data platform and, therefore, RICHFIELDS needs to focus on:

- Aligning the consumer data platform and FNH-RI with other EU research infrastructures

- Breaking down key activities into small manageable tasks
- Building the consumer data platform in manageable stages, focusing on one stakeholder sector at a time (e.g. researchers and then ICT businesses) to grow the business model
- Collaborating not competing
- Advancing the consumer data platform through co-creation, i.e. encouraging ownership and engagement by consumers, researchers and business operators
- Social innovation

4.3 Typical user of a consumer data platform

4.3.1 Group feedback

Typical users of the consumer data platform were identified as:

- Group 1 (Technology): Someone who can find data, based on their knowledge and skill
- Group 2 (Governance): Consumers, [food] industry and researchers as data providers and users
- Group 3 (Citizen science): Science journalist
- Group 4 (Business): Researcher

In terms of using the consumer data platform, the following were identified:

As a ...

- Group 1 (Technology): Data user
- Group 2 (Governance): Consumer, data provider
- Group 3 (Citizen science): Science journalist
- Group 4 (Business): Researcher

I want ...

- Group 1 (Technology): An intelligent user-friendly graphical dashboard
- Group 2 (Governance): Trust, transparency, togetherness [cooperation or collaboration]
- Group 3 (Citizen science): An integrated *ask the expert* data service
- Group 4 (Business): High quality data

So that I can ...

- Group 1 (Technology): Select the right data easily
- Group 2 (Governance): Be confident my data are being used as I wish, my data are adding value and I have a sense of community, as a valued provider
- Group 3 (Citizen science): Report on evidence-based science
- Group 4 (Business): Undertake evidence-based research

Individually, the delegates identified the typical user as coming from 14 broad groups⁸, namely:

1. Academic researcher
2. Anyone wanting information about food and health
3. Associations, NGOs, etc. (non-profit)
4. Business entities (profit)
5. Healthcare including medical and social organisations
6. Commercial research
7. Consumer
8. Food chain actors (e.g. agriculture, food business operator, retailer)
9. Hotels, restaurants and catering industries
10. ICT technology sector
11. Marketing and advertising companies
12. No typical user
13. Policy-makers
14. Surveillance systems

Only six broad reasons were identified for wanting access to RICHFIELDS, namely:

1. High-quality, well-described, real-time, raw and integrated data about food, nutrition and health (diet and lifestyle) from a range of sources, countries (MS) and perspectives
2. Up-to-date dietary tools and SOPs for data interrogation and exploitation
3. European nutritional strategic plans
4. Networking and potential collaborations
5. Dietary advice
6. Business data to understand better why consumers do/ do not buy specific products

⁸ Individual responses can be matched from external delegates in A4.2.2 Responses from external delegates

Similarly, 12 broad applications were identified, namely:

1. Analyse or commission data analyses leading to new research insights/ answers
2. Better tailored communications about [food] products
3. Added value to [food] products
4. Conduct research and foster collaborations with other researchers in Europe or beyond
5. Contribute data on vulnerable population groups
6. Work more efficiently on publications and manage data sources more effectively
7. Generate new knowledge and inform public policy and public level interventions
8. Better access to food business operators and retails, and their datasets
9. Provide information for the food industry and regulators
10. Test a new food matching algorithm
11. Understand better the link between foods consumed and health
12. Use and re-sell data and or aggregated information

Individually, the RICHFIELDS beneficiaries identified the following applications:

- Access to and up-to-date information about all relevant high-quality datasets (diet and health)
- Scientifically validated, trustworthy, ethical, evidence-based and standardised information
- Networking
- Easy to use, facilitating rapid and easy access to relevant data
- Tools, services and support to collecting, using and analysing data

In plenary, reasons for developing and using RICHFIELDS were given as:

- Access to business data, specifically purchase and consumption
- Access to research data (diet and health) from a range of sources
- Development of evidence-based public policy and promotion of public health
- Networking and to foster cooperation
- Provision of data, tool and services
- Training and education

Responses from the pre- and post-event questions suggested RICHFIELDS would be important for:

Pre-event:

- Access to data that would not be available for me in any other way/ answer research questions
- Access to dietary information for consumers, based on their needs and interests
- Better understanding of consumer needs in terms of improving public health
- Connect actors along the food chain/ better risk assessment and exploitation of opportunities
- Do not know
- Leapfrog globally towards sustainable and healthy diets beyond hunger and obesity
- Policy monitoring in the area of food, diet and health
- Stop food safety disasters (e.g. mad cow disease)

Post-event:

- Access to a huge range of diet and health data resources
- Access to scientifically validated, high-quality, well-described, raw and integrated data, which have been obtained ethically and legally/ Better science. Better use of resources. New insights.
- Improve EU SME food business operators and ICT developer competitiveness, minimising risk and enabling exploitation of opportunities in the agrifood sectors
- Inform and improve decision-making for public health/ effective nutrition policy planning
- More efficient networking and cooperation
- Personalised nutrition advice

5. Conclusions

Overall, the delegates and the beneficiaries identified similar potential users of the consumer data platform and reasons why they might access the platform data, specifically for up-to-date/ real-time, high-quality, well-described data describing diet and health issues.

In fact, the scope identified in terms of perceived needs and gaps in existing information was much broader than RICHFIELDS (purchase, preparation and consumption), suggesting stakeholders' requirements are more in line with the food, nutrition and health research infrastructure (FNH-RI).

Almost without exception, the principal role of the consumer data platform and/ or FNH-RI was described not only as providing access, regardless of whether data were raw or aggregated, but also support in (a) selection of the appropriate data, (b) interrogating data correctly, and (c) generating publication-ready reports. Again, this scope is much broader than has been perceived in the scope for RICHFIELDS, which has been described in terms of a federated (virtual) data repository that would facilitate access to determinants of food behaviours for researchers. Instead, stakeholders have expressed a clear need and appetite for tools and services that will undertake data analysis on their behalf as well as providing training and networking opportunities, which is more appropriate for a research infrastructure, such as FNH-RI.

Whilst researchers were recognised as the primary users of both consumer data platform and the FNH-RI, policy-makers including public health, healthcare professionals and allied service, and others (e.g. science journalists) were also identified as benefiting from access to better data as well as consumers. Consumers were not represented amongst the delegates or beneficiaries directly, but their needs were perceived to be those that might be best described as personalised diet and lifestyle advice.

Annex 1: Workshop attendance

A1.1 RICHFIELDS: External participants

Paolo Colombani

Independent consultant (CH)



Paolo is a nutrition scientist. He studied food engineering at the ETH Zurich (MSc) and did his PhD on nitrogen metabolism in endurance athletes at the same university (1993-1998). For 15 years Paolo lectured and carried out research projects in the areas of physical activity, nutrition and health and was head of the Swiss food composition database for six years. He was partner of the FP6 Network of Excellence EuroFIR and president of EuroFIR AISBL. In 2010, Paolo started delivering scientific support in nutrition as an independent consultant to the food industry, top management of different industries including banks, elite athletes, Swiss Olympic, Antidoping Switzerland and many more. Today, he is self-employed and continues to deliver scientific support in food and nutrition. He founded the Swiss Sports Nutrition Society and he is his current president. As a partner of an US based technology start-up, he is also strongly involved in the field of personalised/precise recommendations across different health areas.

Luca Bucchini

Hylobates Consulting Srl. (IT)



Luca Bucchini is a food risk scientist, and an expert in food and food supplement regulation. Galvanised by public health and food risk studies at Johns Hopkins (US), he co-founded the Rome-based food consultancy Hylobates almost 15 years ago. He and his team have helped register thousands of food supplements across Europe, and supported businesses comply with EU law, despite national regulators putting up all sort of barriers. He has worked with the vibrant botanicals industry for years, with its intriguing scientific and regulatory challenges. He regards the 6M€ plant supplement research endeavour – PlantLIBRA - as one of the best, and toughest, project he has contributed to. Luca is happily married to his business partner, Lucilla, and a proud father of three boys. Free time is for exercising, books and week-ends spent watching his kids play basketball or football.

Nadia Slimani
Independent consultant (FR)



Until recently, Nadia was a senior scientist in the Nutrition and Metabolism section at IARC (FR). She has an MSc in Cellular Biology and Physiology and a post-graduate Diploma in Nutrition in Developing Countries, and she obtained her PhD degree in Nutritional Epidemiology at Wageningen University (NL). Nadia has long standing experience in developing, validating and implementing standardised dietary assessment methodologies in international nutritional epidemiological and surveillance settings (i.e. EPIC and EU-Menu/ GloboDiet networks). The data generated were used for descriptive and diet-disease association studies (including cancer and other NCDs) through different projects as well as existing consortia, partnerships and leaderships. She is the coordinator of the EPIC nutrition Working Group and has been (co-) principal investigator, (co-) work package leader and partner in several international funded projects (e.g. EPIC, EFCOVAL, PANACEA, INTERACT, EuroFIR-Nexus, EMP-PANEU, PANCAKE, BBMRI-LPC, EuroDISH, JPI-DEDIPAC). Nadia lead the launch of the Global Nutrition Surveillance -GloboDiet initiative, in close collaboration with WHO, and she was a member of the WHO-IARC collaboration in the context of the Global Action Plan for the Prevention and Control of Non-communicable Diseases 2013-2030 (e.g. COSI project). She is an internationally established researcher in the field of nutritional epidemiology with more than 300 papers published in international peer-reviewed journals (H-index: 67, Times cited: 9611).

Wilke van Ansem
Netherlands Organisation for Health Research and Development (NL)



Wilke is a programme officer at the Netherlands Organisation for Health Research and Development (ZonMw). Within ZonMw, she is responsible for programme development, implementation and evaluation of research programmes (main focus nutrition & health) including advice, guidance and support of programme committees. She is involved in the JPI Healthy Diet for a Healthy Life and, in the past, she has been responsible for the development and implementation of several joint actions of the JPI HDHL (JA ENPADASI, JA Intestinal microbiomics, JA Malnutrition in the Elderly). She also worked on the evaluation of the JPI HDHL, the update of the 1st Strategic Research Agenda and she developed the FAIR data guideline and procedure for the JPI HDHL. Wilke is trained as a dietitian, she holds a PhD in Health Sciences from the Erasmus University in Rotterdam and a Master's degree Health Sciences with two specialisations (public health prevention, and infectious diseases) from the VU Amsterdam.

Karl Presser
ETH Zurich and Premotec GmbH (CH)



Karl is the founder of Premotec GmbH and works as a senior scientist in the Department of Computer Science at ETH Zurich (CH) in the Global Information Systems Group. He trained as a computer scientist and earned his doctoral degree at ETHZ investigating data quality on food composition data focusing on basic principles of data quality and how a computer system can support users to manage data quality; he also created of FoodCASE in which some of his research work is incorporated. After his computer science studies, he worked for four years in an SME as database designer, creating a relational database to store and calculate timetables for universities and secondary schools using artificial intelligence in evolutionary algorithms.

Fred van Alphen
Independent consultant (NL)



Fred van Alphen studied Political science and Business at the Erasmus University in Rotterdam (NL), and now helps (ICT) companies to improve their (ICT) organization and business performance. Currently, he is working with Propredict BV, as Business consultant. He has more than 25 years' experience in IC technologies, data mining, predictive analytics, big data and management. Fred has also worked for more than 20 years as a Director in professional services for American software providers in BI. He started his business helping companies set up their BI organisation but, very soon, was asked for interim positions in ICT manager, CIO, COO and organisational challenges, which he still does today.

Giulia Vilone
Creme Global Ltd. (IE)



Giulia Vilone is a senior data analyst at Creme Global Ltd., a data science company based in Dublin (IE) specialising in predictive modelling and software for assessing consumer health.

Damian O'Kelly
Nutritics (IE)



Damian O'Kelly is CEO and co-founder of Nutritics, a nutrition analysis software system developed specifically for nutrition professionals. Having completed a BSc in Exercise Science and Health in 2008 and MSc in Sports Nutrition in 2011, Damian has used countless nutrition software programmes, and became frustrated that none could deliver what he needed to work with his clients most effectively. Damian's mission is to facilitate practitioner led delivery of effective, efficient, and evidence based dietary interventions. Nutritics' award winning software platform has been used by over 25,000 nutrition professionals in 120 countries since its launch in 2013.

Frankie Douglas
Nutritics (IE)



Frankie recently joined Nutritics as the regulatory affairs officer. She is a public health nutritionist with a background in nutrition-related food law. Frankie has four years' experience working as the technical executive in public health nutrition for the Food Safety Authority of Ireland. Frankie was the primary researcher involved in the development of MenuCal (a calorie calculator and allergen management system designed to support SME food businesses in Ireland) and was the permanent Irish representative on European working groups relating to nutrition and health claims and foods for specific groups. She has extensive experience working in the areas of business development and management within the food industry in Ireland. Frankie's research publications are in the areas of public health nutrition and nutrition related food legislation.

Simon Haafs
i3B (NL)



Simon Haafs is managing director of the ICT for brain, body and behaviour (i3B) innovation network. i3B connects companies and knowledge institutes and end users to investigate, develop and accelerate ICT solutions on monitoring a Healthy Lifestyle. Simon has a Master's in business administration. His work experience is in cluster collaboration and project development, management.

Maria Romeo-Velilla
EuroHealthNet (BE)



María Romeo-Velilla joined the EuroHealthNet as a European Research Project Assistant in October 2017. Prior to EuroHealthNet, Maria completed a PhD in Health Promotion at Staffordshire University (UK), which explored how individual- and community- 'real world' health promotion programmes can complement each other to empower participants and help tackle health inequalities using a qualitative approach. Maria has an MA in Sports Management (University of Central Lancashire, UK), and previously worked at the Research Institute for Sport and Exercise Science in Liverpool John Moores University (UK). She has also lectured at the University of Central Lancashire. Before moving to the UK, Maria graduated as Physical Education teacher in University of Zaragoza (Spain) and taught Physical Education in a Secondary School of Spain.

Thomas Arnold
Directorate-General Research and Innovation, European Commission



Thomas Arnold holds the position of Advisor "Sustainable Bioeconomy" in Directorate-General Research and Innovation of the European Commission. Previously he has worked as Head of Unit in DG Research and Innovation with responsibility for different areas, including International Scientific Cooperation, Research and SMEs and Marie Skłodowska-Curie actions.

Maria Glibetic
Institute for Medical Research (RS)



Maria, Director and vice-President (IMR - RS) of EuroFIR AISBL, is head of the Centre of Research Excellence in Nutrition Research at the Institute for Medical Research in Belgrade (RS). She is involved in a wide range of activities around food and nutrition sciences, research into food bioactives and health effects, food composition and analysis, dietary intake assessment, nutritional intervention human studies and impact on health. Maria has considerable experience of coordinating both national and international projects and has participated in 10 EU-funded projects. Maria and her team were responsible for creation of first online national food database in Serbia. She also has extensive experience in scientific publishing with 120 publications and, currently, is also an editor for Elsevier's online Food Module.

Birdem Amoutzopoulos

Medical Research Council Elsie Widdowson Laboratory (UK)



Birdem is working as dietary assessment and food composition manager at the Medical Research Council - Elsie Widdowson Laboratory (previously the Human Nutrition Research, UK) where she provides scientific expertise and advice for the various nutrition studies in the Unit, particularly the UK National Diet and Nutrition Survey (NDNS) and manages the Dietary Assessment Team. Previously, she worked as a senior researcher and was involved in various European Union projects, such as EuroFIR (FP6-FOODCT-2005-513944) and carried out dietary intervention studies and developed large nutrition-related databases. She holds a PhD in Nutrition and Dietetics, and has developed skills in nutrition surveys, dietary assessment methods and food composition databases.

Maria Kapsokefalou

Agricultural University of Athens (GR)



Maria Kapsokefalou is an Associate Professor in Human Nutrition and the Deputy Rector on Student Affairs, Academic Collaborations and Outreach. She is a member of the National Council for Research and Innovation and the Scientific Advisory Board of the Hellenic Food Safety Authority of the Ministry of Rural Development and Food, the Hellenic Pasteur Institute and the National Committee on Nutrition Policy of the Ministry of Health. Her research activities aim to promote Public Health through better nutrition. She is investigating health benefits of bioactive compounds and novel and functional foods, linking nutritional sciences and food science. Activities include evaluating dietary intake in the general adult population and in children, pregnant women and older adults but she has also conducted studies on food, beverages and water intake in various population groups and the socioeconomic factors that affect food intake. Maria has also studied food aid models and food policy measures that aim to alleviate food insecurity in vulnerable populations, such as school lunches, food packages, food banks etc. Her scientific interests include outreach programmes on the sustainable development of the agro-food sector in Greece. She is also the mother to three daughters.

Aida Turrini

Consiglio per la ricerca in agricoltura e l'analisi dell'economia agraria– Centro di Ricerca per gli alimenti e la Nutrizione (CREA-Alimenti e Nutrizione) (IT)



Aida's expertise is mainly in nutritional surveys, acquired over 30 years of work at the research institute, now Research Center for Food and Nutrition (CREA - Council of Agricultural Research and Economics) formerly the National Institute of Nutrition. She has a statistical background and has developed research nutritional database systems as well as food coding and classifications. She is author of peer-reviewed papers, co-authored as a research group member, and reviewed proceedings, chapters and books. Overall, Aida has 98 international publications (60 peer-reviewed as author) and 59 national publications (38 peer reviewed as author). She is registered as ORCID 0000-0002-2188-9406 and RESEaRCH ID K-5353-2016. She is also an experience teacher in graduate and post-graduate courses. Aida is collaborating in national (e.g., CLUSTER AGRIFOOD) and international committees, such as the Network on Food Consumption Data (European Food Safety Authority), and international association like EuroFIR AISBL. Currently, she is a senior researcher (level I) leading the research group in "Nutritional food consumption population study". Her main research task is the coordination of the fourth Italian nationwide dietary survey.

Klazine van der Horst
Nestlé Institute of Nutritional Science



Klazine van der Horst has worked extensively on dietary intake and eating behaviours of infants and children in academia and industry. Currently, she is group leader of the dietary intake research group at the Nestlé Research Center. This group of 9 senior scientists conducts global research projects on dietary intake and eating behaviours in infants and children in several countries around the world. Klazine holds a Doctorate in Public Health and a Master specialization in Health Education & Health Promotion. She has worked as a Postdoctoral scientist at the Swiss Federal Institute of Technology (ETH) in Zurich where she initiated the work around the influence of involvement in meal preparation and cooking skills on children's eating behaviours. After joining the Nestlé Research Center in 2011 she continued this line of research together with several other activities like program manager for the research program on sustainable nutrition. She is also associate editor for BMC Public Health.

Vladimir Vietoris
Slovak University of Agriculture in Nitra (SK)



Vladimir Vietoris, PhD is a well-respected sensory analyst who has, for the last 15 years, created many sensory methodologies. In 2009, he participated on creation of the first database of Slovak blaufrankisch wines measured using an electronic tongue. After a stay in Brazil (UFLA, Lavras), he was a co-creator of open source sensory software SensoMaker. He is a lecturer and researcher at the Slovak University of Agriculture in Nitra, and an assessor in the Slovak National Accreditation Service (SNAS) for personal certification bodies according to ISO 17024. He is an international relations manager for the journal Potravinárstvo (Slovak Journal of Food Science) and a reviewer for journals in the field of Sensory science.

Maartje van den Berg
RaboResearch Food & Agribusiness



As a senior analyst in Rabobank's Food and Agriculture Research and Advisory unit, Maartje focuses on the consumer foods sector. Maartje brings a wealth of international Rabobank experience; over the past years she has worked in several client-facing positions including renewable energy research and advisory, corporate lending, project finance and export finance. Most recently she worked in the 'problem' loan department where she managed a diverse global portfolio of clients. Before joining Rabobank, Maartje worked at Royal Dutch Shell and at a Dutch government agency now called RVO (Rijksdienst voor Ondernemend Nederland), part of the Dutch Ministry of Economic Affairs. She has a university degree in Physical Geography from the University of Utrecht in the Netherlands. Maartje brings strong analytical, writing and presentation skills and is a creative thinker. She has a wealth of experience in communicating with clients and other stakeholders.

A1.2 RICHFIELDS: Beneficiaries

Siân Astley

European Food Information Resource (EuroFIR AISBL, BE)



Siân has worked extensively with individuals and organisations throughout Europe from a variety of disciplines including research, food and biotech industries and the media. She is author of more than 300 popular science articles for magazines and trade publications as well as 27 peer-reviewed papers, and she was awarded her Diploma in Science Communication in 2009 (Birkbeck University of London). After 14 years as a bench-scientist, Siân became Communications Manager for NuGO, one of the first FP6 Networks of Excellence, and was the European Communications Manager for the Institute of Food Research in Norwich (UK) until April 2012.

Currently, she is a senior researcher and the training and communications manager for the European Food Information Resource (EuroFIR AISBL), supporting research as well as training and communications activities within EU-funded research projects and networks. She is also an independent science communicator and an editor for Food Chemistry.

Marc-Jeroen Bogaardt

Wageningen Economic Research (NL)



Marc-Jeroen is working at Wageningen Research as a senior researcher with a degree in political sciences as well in engineering. He focuses on the interaction between technology, agrifood and governance. Most of his research projects are commissioned by the Dutch Ministry of Economic Affairs, agribusiness enterprises, farmers' cooperatives, and the European Commission. These projects deal with big data and smart farming, cybersecurity in the agrifood chain, data platforms as inter-organisational collaborations. He examines particularly the legal and institutional issues of technology applications like Internet of

Things, Cloud Computing and Big Data technologies: shifts of power relations, new governance and decision-making structures, data protection, ownership of data, privacy and security.

Javier de la Cueva

Independent Consultant (ES)



Javier de la Cueva holds a Licentiate degree in Law and is a PhD from the Complutense University of Madrid (ES) where he is also an Associate Professor. He works as a practicing lawyer and as a university lecturer. As a lawyer, he has defended free intellectual property licenses and diverse technological platforms. Javier is also engaged in programming technological projects, giving lectures and writing about his specialisation. He is a GNU/Linux user since 1998 and a systems administrator for this operating system since 2003. He writes scripts in Python and enjoys n3 notation when modelling semantic web ontologies. Finally, he is a patron of Fundación Ciudadana Civio.

Tome Eftimov

Jožef Stefan Institute (JSI, SI) & Jožef Stefan International Postgraduate School (SI)



Tome Eftimov was born in Strumica, Macedonia. His BSc Eng. and MSc Eng. in electrical engineering and computer science are from the University of Ss. Cyril and Methodius, Skopje (MK) in 2011 and 2013, respectively. Currently, he is completing his PhD, at the Computer Systems Department, Jozef Stefan Institute, on “Statistical data analysis and natural language processing for nutrition science”. In 2011, he was a teaching assistant in probability and statistics at the Faculty of Electrical Engineering and Information Technologies, Ss. Cyril and Methodius University and, in 2012, joined the Laboratory for Complex Systems and Networks at Macedonian Academy of Sciences and Arts, where his research interests were in noncoherent communication. His current research interests include statistics, natural language processing, machine learning, data mining, text mining, and semantic web.

Bent Egberg Mikkelsen

Aalborg University (DK)



Bent holds a M.Sc. of Food Science from the Royal Agricultural University, Copenhagen and a PhD in Social Science, from Roskilde University. He is the author of many publications on public health nutrition and sustainable public food systems. Bent has been as the principal investigator on several research projects and his work include several assignments on nutrition at schools and hospitals for the Council of Europe, food and nutrition at work for the Nordic Council of Ministers, healthy eating at school for the European WHO regional office and the EU platform for Health, Diet and Physical activity. He is a Professor of Nutrition and Public Food Systems at Aalborg University. He is the past president of an EU expert committee for the school fruit scheme (SFS). He is also a member of the advisory boards for ProMeal, Glamur and VeggieEat and FoodLinks EU-funded projects. Bent is a member of scientific panel in the Sapere Taste Education network and the Management committee of COST action IS1210. He is the principal investigator on the SoL Multi-Level Multi-Component community intervention on healthier eating.

Paul Finglas

Institute of Food Research (UK)



Paul Finglas joined the Institute of Food Research in 1981 and is, currently, Head of the Food Databanks National Capability at IFR (www.ifr.ac.uk/fooddatabanks), and research leader in Food and Health. He has, for most of his science career, been involved in food nutrition and health including food composition and analysis (nutrients & bioactive compounds), traditional and ethnic foods, food description and data quality, dietary intake assessment, nutritional labelling & health claims, reformulation and impact on food intake and health, personalised nutrition and research infrastructures. Paul has considerable experience in both participating in EU projects in food, nutrition and health (PRECIOUS, REFRESH & RICHFIELDS) as well as leading (EuroFIR, TDS-EXPOSURE & BACCHUS). Paul has a broad range of experience in science publishing and is editor for the journals Food Chemistry, and Trends in Food Science and Technology. Paul has a degree in Chemistry from Aston University in Birmingham and has published over 150 publications on a wide range of topics in food science and nutrition. He is also the President for EuroFIR AISBL, a non-profit organisation based in Brussels (BE).

Charo Hodgkins

Consumer Behaviour and Health Research Centre, University of Surrey (UK)



Charo is a science graduate and started her career with GSK as a development chemist. In 1997, she moved to the retail sector as Head of Technical Services for Superdrug Stores PLC. During her 14 years in industry, she gained extensive experience of managing technical and data management projects within both branded and retail environments. Her expertise includes research and development, manufacturing, and quality/supply chain management for a wide range of products including, pharmaceuticals, medical devices, foods, toiletries and non-foods. Her responsibilities also involved extensive auditing of production facilities across Europe and the development and delivery of training packages in Continuous Improvement, HACCP, Data management, Crisis Management and Problem Solving techniques. In 1999, Charo took a short career break to start a family and in 2002 joined the Food, Consumer Behaviour and Health Research Centre at the University of Surrey as a Research Fellow. She has been active in several UK and EU funded research projects in the areas of food, consumer behaviour and public health. Charo has recently completed her PhD investigating the role of food composition data, nutrition information and health claims in communicating healthier food choices.

Kerstin Lienemann

German Institute of Food Technologies (DIL, DE)



Kerstin is head of the DIL Office Brussels and the DIL Unit Networks since 2009. DIL is a research institute with a strong focus on food processing, product development and bio-economy, and it is member of the European Institute of Innovation and Technology Food (EIT Food). Within the scope of her activities Kerstin is responsible for all kind of trans-national (esp. ERA-Nets), European (esp. FP7, H2020) and world-wide public funded research activities of DIL. Her experience ranges from coordination of the European Network of Excellence HighTech Europe (FP7) to several other roles (fund raising, consortium building project negotiation, project (lead) partner, legal & financial issues, dissemination) in more than 20 projects. She is active in the FoodFORCE network and was engaged for a long time in the ETP Food for Life. From 2006-09 she headed the Liaison Office of two German research organisations (German plant breeders /GFPI e.V. and German food industry /FEI e.V.). Kerstin holds a PhD in Agrobiology.

Angelika Mantur-Vierendeel

European Food Information Resource (EuroFIR AISBL, BE)



Angelika joined EuroFIR in November 2015 as a Research Associate. She is responsible for support with the on-going and new EU projects on food and health, assisting with membership recruitment and training. She studied dietetics at the Medical University of Bialystok (Poland), where she obtained her Master's degree in June 2013. She worked as a dietitian for MedFitness, where she was responsible mainly for consultations with clients and nutritional advice. She has participated in many medical and fitness conferences and trade shows, presenting body composition analysers and performing body composition analysis. Angelika took part in 'Keep the Balance', organised by the Polish Dieticians Association and National Food and Nutrition Institute, where for three months she educated patients on nutrition and well-being.

Golboo Pourabdollahian

Institute of Industrial Technologies and Automation (ITIA, IT)



Golboo received her PhD from politecnico di Milano in Management, Economics and Industrial Engineering. Her research activities and interests are business models, personalisation and mass customisation, product-service systems, and manufacturing sustainability and technology road-mapping. She is engaged in different projects at European and national levels and has authored several scientific publications.

Monique M. Raats

Consumer Behaviour and Health Research Centre, University of Surrey (UK)



Monique is Director of the University of Surrey's Food, Consumer Behaviour and Health Research Centre. Her portfolio of research is wide ranging in terms of topics being addressed (e.g. food choice, food preparation, policy development, food labelling), and methodologies used (e.g. qualitative, quantitative, stakeholder consultation). She has published over 110 peer-reviewed papers, 19 book chapters, and co-edited two books (The Psychology of Food Choice; Food for the Ageing Population). She is a founding member of the International Society of Behavioral Nutrition and Physical Activity. In 2011 Monique joined the UK's Scientific Advisory Committee on Nutrition and is a member of its Subgroup on Maternal and Child Nutrition.

Currently she is a partner in the Horizon 2020 RICHFIELDS project that aims to design a consumer-data platform to collect and connect, compare and share information about our food behaviours, to revolutionise research on every-day choices made across Europe and PROSO project that is to providing guidance on how to encourage engagement of citizens and third sector organizations, like non-governmental organizations (NGOs) and civil society organizations (CSOs), in Europe's research and innovation processes. She also coordinates REDICLAIM, which investigates how EU legislation impacts on the substantiation and use of "reduction of disease risk" claims on food and drinks.

Hennie van der Veen

Wageningen Economic Research (NL)



Hennie van der Veen is a senior researcher and project manager with Wageningen Economic Research (Part of Wageningen University & Research) in the field of business economics, data and modelling. She studied quantitative business economics in Groningen. After two years working at the University of Groningen, in 1997 she became a researcher at Wageningen Economic Research. She has worked on projects related to (financial economic) modelling, sampling and the Farm Accountancy Data Network. She led a large number of projects related to the Farm Accountancy Data Network, getting more and more specialized in project management. She is an IPMA-certified project

manager with a specialization in Agile project management and leading a large EU-funded project on the design of a research infrastructure for the food consumption domain (RICHFIELDS).

Karin Zimmermann

Wageningen Economic Research (NL)



Karin is a senior researcher in Strategic Marketing. She is engaged for various EU-funded projects, as a senior researcher and project manager, undertaking research on consumer behaviour and consumer driven and responsive chain (ISAFRUIT, Focus Balkans, PEGASUS, DG CLIMA), communication (CONNECT4ACTION, SUSFANS) and (conceptual) design of a European research infrastructures for food, nutrition and health (EuroDISH, RICHFIELDS). Since 2015, Karin has been a member of the Executive Management Board of the European Food, Nutrition and Health Infrastructure (FNH-RI). Currently, she is also a programme manager for research infrastructures.

Annex 2: Workshop programme

A2.1 Workshop agenda (proposed)

Monday 11th December 12:00 midday Arrive for light buffet lunch

13:00-13:30 Short introductions (from delegates, name and affiliations, interest in RICHFIELDS)

13:30-14:00 Wider food, nutrition and health landscape (science vision and mission)

Paul Finglas, Quadram Institute Bioscience UK

Karin Zimmermann, Wageningen University & Research NL

14:00-14:30 Phase 3 update: Realising the design for RICHFIELDS's consumer data platform

Marc-Jeroen, Wageningen University & Research NL

14:30-14:45 Open (moderated) discussion (rapporteur: Siân Astley – EuroFIR AISBL BE)

14:45-14:50 General partner introductions & Aims and objectives for the workshop

Siân Astley, EuroFIR AISBL BE

14:50-17:30 Parallel working groups

- **Group 1: Using consumer-, research- & business-generated data: Information technology requirements** - Tome Eftimov (JSI, SI) & Fred van Alpen (Propredict BV, NL)
- **Group 2: Ethical, legal and societal issues: Framework for practice** - Javier de la Cueva (Consultant, ES) & Wilke van Ansem (ZonMW, NL)
- **Group 3: Using consumer-, research- & business-generated data for research: Envisaging the future – innovation, citizen science and other breakthroughs** - Bent Egberg Mikkelsen (AAU, DK) & - Birdem Amoutzopoulos (MRC UK)
- **Group 4: Business model of RICHFIELDS: value propositions, key suppliers and key activities** - Golboo PourAbdollahain (CNR, IT) & - Luca Bucchini (HYLO, IT)

19:00 Dinner at Restaurant Notos (Mediterranean/ Greek cuisine)

Rue de Livourne 154, 1000 Bruxelles

Tuesday 12th December Parallel working groups & feedback

(rapporteur: Siân Astley – EuroFIR AISBL BE)

09:00-10:30 Feedback and discussion from group

09:00-09:15 Group 1: Using consumer-, research- & business-generated data: Information technology requirements - Tome Eftimov (JSI, SI)

09:15-09:30 Group 2: Ethical, legal and societal issues: Framework for practice - Javier de la Cueva (Consultant, ES)

09:30-09:45 Group 3: Using consumer-, research- & business-generated data for research: Envisaging the future – innovation, citizen science and other breakthroughs - Bent Egberg Mikkelsen (AAU, DK)

09:45-10:00 Group 4: Business model of RICHFIELDS: value propositions, key suppliers and key activities - Golboo PourAbdollahain (CNR, IT)

10:00-10:15 Open (moderated – Paul Finglas) discussion

10:15-10:30 Break

10:30-13:00 Feedback from delegates

“Where do you and your organisation fit in the wider FHN-RI?”

Every delegate will have five minutes to present a response

13:00-13:15 Wrap-up and next steps

13:15 ... Lunch and close

A2.2 Workshop agenda (actual)

Monday 11th December

14:15-14:30 **General partner introductions & Aims and objectives for the workshop**

Siân Astley, EuroFIR AISBL BE

14:30-15:00 **Wider food, nutrition and health landscape (science vision and mission)**

Karin Zimmermann, Wageningen University & Research NL

15:00-15:30 **Phase 3 update: Realising the design for RICHFIELDS's consumer data platform**

Marc-Jeroen, Wageningen University & Research NL

15:30-17:30 **Parallel working groups**

19:00 Dinner at Restaurant Notos (Mediterranean/ Greek cuisine)

Tuesday 12th December Parallel working groups & feedback

09:00-10:30 Parallel working groups

10:30-10:45 Break

10:45-11:45 Open feedback from the groups (moderated – Paul Finglas)

- 10:30-10:45 Group 1: Using consumer-, research- & business-generated data: Information technology requirements - Tome Eftimov (JSI, SI)
- 10:45-11:00 Group 2: Ethical, legal and societal issues: Framework for practice - Javier de la Cueva (Consultant, ES)
- 11:00-11:15 Group 3: Using consumer-, research- & business-generated data for research: Envisaging the future – innovation, citizen science and other breakthroughs - Bent Egberg Mikkelsen (AAU, DK)
- 11:15-11:30 Group 4: Business model of RICHFIELDS: value propositions, key suppliers and key activities - Golboo PourAbdollahain (CNR, IT)

11:45-13:00 **Feedback from delegates**

“Where do you and your organisation fit in the wider FHN-RI?”

13:00-13:15 **Wrap-up and next steps**

13:15 ... **Lunch and close**

A2.3 Presentations

14:15-14:30 **General partner introductions & Aims and objectives for the workshop**
Siân Astley, EuroFIR AISBL BE



Richfields Food | Consumer | Health
Envisaging a consumer data platform

Stakeholders' Workshop 3
Envisaging a consumer data platform

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Congratulations! You've made it ...



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Workshop 3: Agenda - Today

13:30-14:00 **Wider food, nutrition and health landscape (science vision and mission)**
Paul Finglas, Quadram Institute Bioscience UK
Karin Zimmermann, Wageningen University & Research NL

14:00-14:30 **Phase 3 update: Realising the design for RICHFIELDS's consumer data platform**
Marc-Jeroen, Wageningen University & Research NL

14:30-14:45 **Open (moderated) discussion**

14:45-14:50 **General partner introductions & Aims and objectives for the workshop**
Siân Astley, EuroFIR AISBL BE

14:50-17:30 **Parallel working groups**

19:00 **Dinner at Restaurant Notos (Mediterranean/ Greek cuisine)**
Rue de Livourne 154, 1000 Bruxelles

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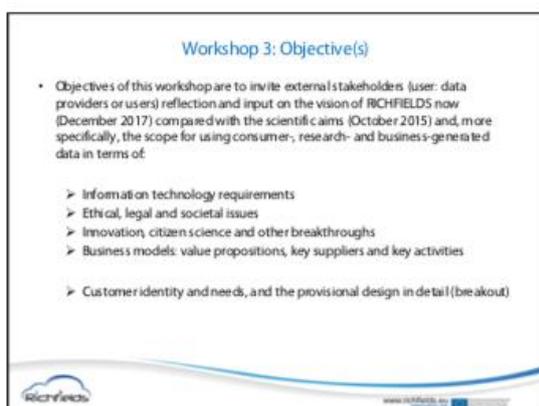


Workshop 3: Welcome from RICHFIELDS!



Siân Marc-Jeroen Javier Paul
Tome Chad Bert Galood Monique
Henrie Angelika Karin

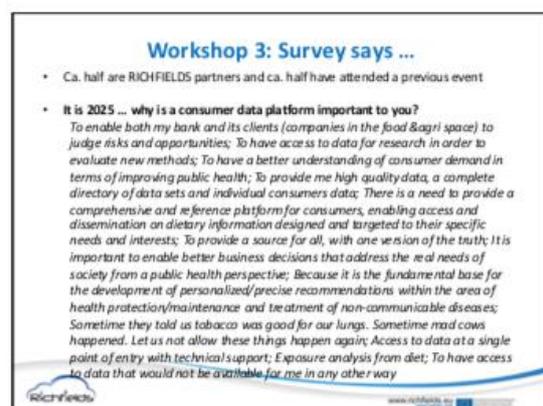
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Workshop 3: Objective(s)

- Objectives of this workshop are to invite external stakeholders (user: data providers or users) reflection and input on the vision of RICHFIELDS now (December 2017) compared with the scientific aims (October 2015) and, more specifically, the scope for using consumer-, research- and business-generated data in terms of:
 - Information technology requirements
 - Ethical, legal and societal issues
 - Innovation, citizen science and other breakthroughs
 - Business models: value propositions, key suppliers and key activities
- Customer identity and needs, and the provisional design in detail (breakout)

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Workshop 3: Survey says ...

- Ca. half are RICHFIELDS partners and ca. half have attended a previous event
- It is 2025 ... why is a consumer data platform important to you?
To enable both my bank and its clients (companies in the food & agri space) to judge risks and opportunities; To have access to data for research in order to evaluate new methods; To have a better understanding of consumer demand in terms of improving public health; To provide me high quality data, a complete directory of data sets and individual consumers data; There is a need to provide a comprehensive and reference platform for consumers, enabling access and dissemination of dietary information designed and targeted to their specific needs and interests; To provide a source for all, with one version of the truth; It is important to enable better business decisions that address the real needs of society from a public health perspective; Because it is the fundamental base for the development of personalized/precise recommendations within the area of health protection/maintenance and treatment of non-communicable diseases; Sometime they told us tobacco was good for our lungs. Sometime mad cows happened. Let us not allow these things happen again; Access to data at a single point of entry with technical support; Exposure analysis from diet; To have access to data that would not be available for me in any other way

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Workshop 3: Agenda – Tomorrow: All about you ...

09:00-10:15 Further discussion in groups

10:15-10:30 Break

10:30-11:30 Feedback from groups

11:30-12:30 Feedback from delegates

"Where do you and your organisation fit in the wider FHN-R?"
Every delegate will have five minutes to present a response

12:30-13:00 Q & A, and wrap-up

13:15 Lunch and close



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14:30-15:00 **Wider food, nutrition and health landscape (science vision and mission)**
 Karin Zimmermann, Wageningen University & Research NL

Building a research infrastructure for Food, Nutrition and Health Research (FNH-RI) in Europe

Linked Data Sharing to Foster Consumer Based Science enabled by RICHFIELDS
 Karin Zimmermann, Project coordinator; Paul Finglas, Member RICHFIELDS PMT

WAGENINGEN RICHFIELDS

Index

1. Why
2. What
3. How

WAGENINGEN RICHFIELDS

1. Why

The FNH-RI Science case

WAGENINGEN RICHFIELDS

Societal trends

Digitisation <ul style="list-style-type: none"> Data platforms, linked open data, standards Apps, sensors, wearables 	Integration <ul style="list-style-type: none"> Implementation in societal policies and practices to be overcome
Personalisation <ul style="list-style-type: none"> Individual food back structures Quantified self 	Citizen science <ul style="list-style-type: none"> Citizens become engaged in research
Globalisation <ul style="list-style-type: none"> Global markets and global SOOs Internet 	Consumers & Data

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Societal challenges

Food 2030

- Hunger, malnutrition, food safety & diet-related diseases
- Climate resilience primary production
- Sustainability and circularity in food systems
- Boosting innovation and empowering communities

WAGENINGEN RICHFIELDS

The consumer as link between the agri-food and health sector

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Knowledge gaps and breakthroughs

Knowledge gaps:

- Personalized feedback
- Psychosocial & volitional mechanisms
- Interventions in agricultural chains and food environment

Breakthrough potential by:

- Biology & behaviour
- Health & sustainable environment
- Multiscale (local-global)
- Inter & transdisciplinary
- Public & private data

Supported by:

- Trends in ICT
- Open science
- Real-time data
- Consumer engagement

2. What

RIs: enabling response to scientific & societal challenges

• Helps shape scientific communities

• Attract young people to science & attract the best researchers around the world

• Build bridges between national research communities and scientific disciplines via users from different countries

Education

Research Infrastructures
centre of knowledge triangle

• Upgrade research services, facilities and resources and related services

- Virtualised
- Distributed
- Virtual

• Scientific disciplines & technological development

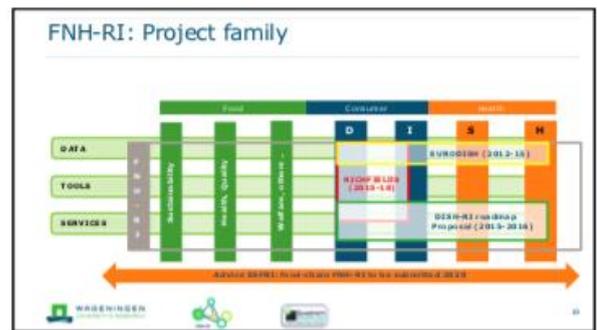
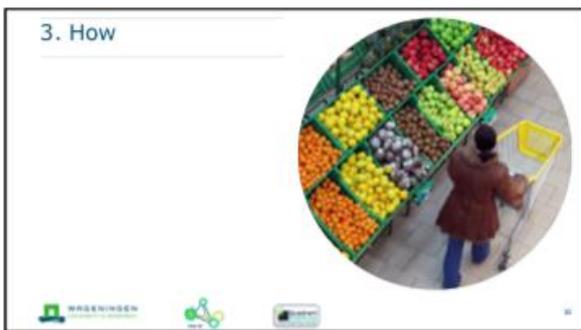
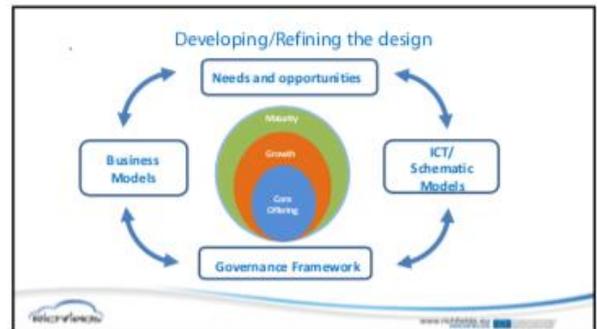
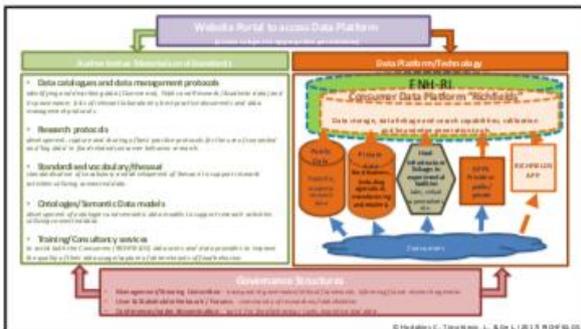
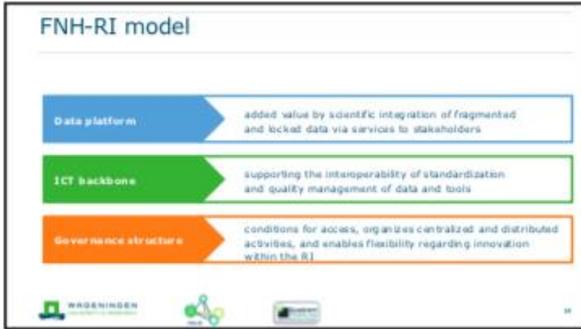
Research ESFRI Strategic Working Group Health & Food Innovation

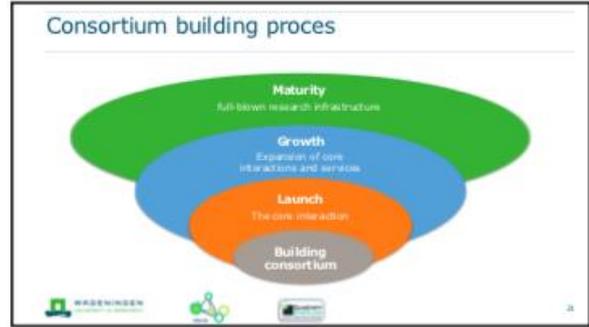
Research Infrastructures: overcome fragmentation

Aim of FNH-RI

FNH-RI aims to be an overarching, mainly virtual, integrated research environment to collate, validate, harmonize and connect existing and future research data & tools, labs & experimental facilities.

FNH-RI Overarching platform and interoperability Conceptual design FNH-RI





Adjacent RIs – providing services and tools

ECRIN

- centres for patients in EU
- evidence for trials
- standards for data

BRISQ-ERIC

- ethics check
- guidance on ethical, legal, and data issues when marketing data

ECHO-ERIC

- meetings and standards for food labs on food safety, food quality and food data

EuroFIR

- cooperation and participation of standards by EUROPEAN countries, storage and access

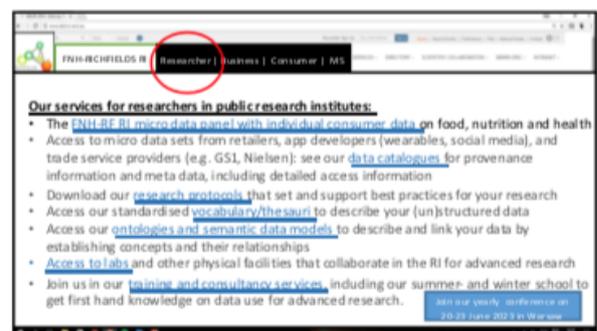
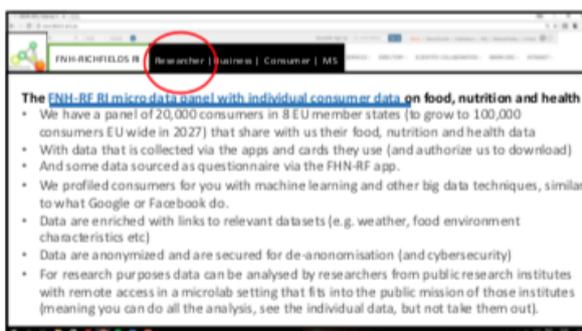
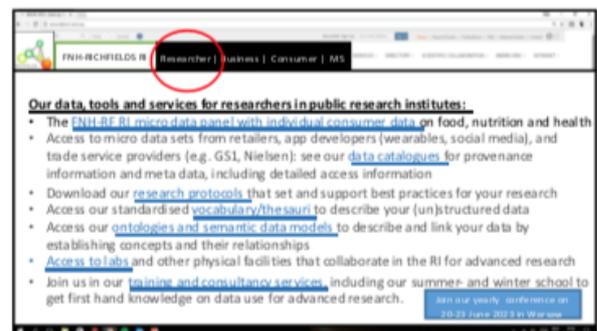
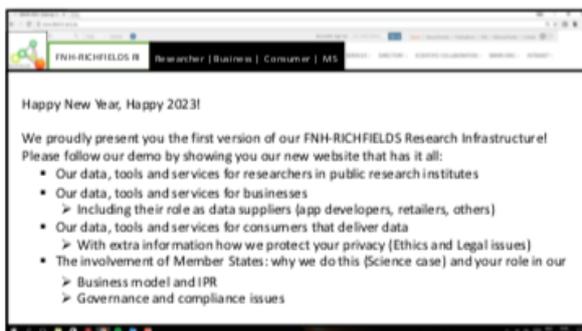
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Partners:

15:00-15:30 Phase 3 update: Realising the design for RICHFIELDS's consumer data platform
 Marc-Jeroen, Wageningen University & Research NL



FNH-RICHFIELDS RI Researcher | Business | Consumer | MS

Food Companies, Retailers (including Out of Home), Service companies (GS1 etc)

- **Benefits for your CSR** (Corporate Social Responsibility) program: help your clients and governments to create a healthy food environment, [by making your data available](#).
- Become a sponsoring member: Gold (€ 50.000/yr), Silver (€ 35.000/yr), Bronze (€ 20.000/yr) for aggregate data and join our conferences with latest insights from top-researchers.
- Your research labs can use our services for researchers with the exception of the micro data.
- Gold-members can commission research with the micro-data.

ICT companies (app developers)

- help your clients and governments to create a healthy food environment, [by making your data available](#).
- We can help your app development with know how and assess quality with logo award (FNH-RF app link Inside)

FNH-RICHFIELDS RI Researcher | Business | Consumer | MS

Food Companies, Retailers (including Out of Home), Service companies (GS1 etc) ICT companies (app developers)

You can support the FNH-Richfields RI, and your clients, by making your data available. Two options:

- Provide access for our researchers to your (anonymized) data sets, let's talk on the conditions
- Let your clients cooperate in [our FNH-RF RI micro data panel](#) by giving them digital access to their data in your computers and let them share it with us

FNH-RICHFIELDS RI Researcher | Business | Consumer | MS

Make a difference in food- and health research and share your data to research now.

- Download [our FNH-RF RI app](#) on your smart phone or ipad
- Use your social media account (Facebook, LinkedIn etc) to log in and share the data from other food, lifestyle and health apps with us. Take 10 minutes and you're done.
- Answer the questions on food and health we pose at irregular intervals in the app.

In return we inform you with a newsletter how your data was used in research
After 1 year participation our system generates detailed advice on your food pattern, and how to make it more healthy.

We do our best that your privacy is not compromised. Researchers get access to anonymised data only, and can not copy the individual data. Commercial organisations or governments do not get access, although they can commission relevant research within our ethical framework. We are a mainly publicly financed facility and data management is compliant with the EU's GDPR. Overseen by a strong ethics committee.

FNH-RICHFIELDS RI Researcher | Business | Consumer | MS

- FNH-RF RI is a facility of the Member States of the European Union and the European Commission to support the research on the relation between food, nutrition and health of citizens, with an [approach based in citizen science and the digital commons](#)
- The governments support such research as
 - Healthy and sustainable diets for a healthy life are a public concern, given food-related diseases and the need for sustainable diets. Results in food policy.
 - Developments in medical research (e.g. genetics, neurobiology) will lead to better understanding of the role of food and lifestyle in prevention and cure of diseases
 - Results of research in the relationship of food and health can be turned into advice in the form of personalised nutrition (with the support of developments in ICT) and preventive health management
 - Results can also be used to improve food with the help of fast breeding techniques

[See examples](#)

FNH-RICHFIELDS RI Researcher | Business | Consumer | MS

Examples of advanced research with our data:

- Does eating strawberries and other fruits with residues of pesticides effect health, e.g. lead to a higher risk of cancer? Can we provide a researcher in cancer with 3 year food consumption data, including production methods (block chain?) of that food?
- Can changes in food and drink intake predict short term health issues? (e.g. does drinking less water in warm weather predict gout / arthritis?)

FNH-RICHFIELDS RI Researcher | Business | Consumer | MS

- We invite national member states to become a supporter and donor of the FNH-Richfields RI and the [national node](#) in their country.
- FNH-Richfields RI has mainly been designed in European projects (EuroDISH, Richfields) and constructed in the European ESFRI project FNH-RI 2020-2023 (that also upgraded the Richfields design to the design of the FNH-RI).
- The coming 4 years (2023-2027) the RI - including its national nodes - is financed by the EU's ESFRI program (50%, 5 min. per year) and member states (40%) with some additional finance (1 min per year) from businesses (and other donors like patient organisations?).
- Member states that currently (2023 onwards) finance the RI are: Netherlands, Denmark, United Kingdom, Italy, France, Slovakia.

For more information on the usefulness for your country to join the FNH-Richfields RI: contact Karin.Zimmermann@wur.nl

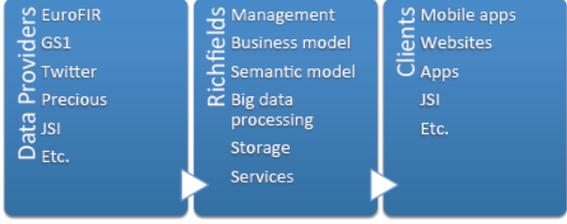
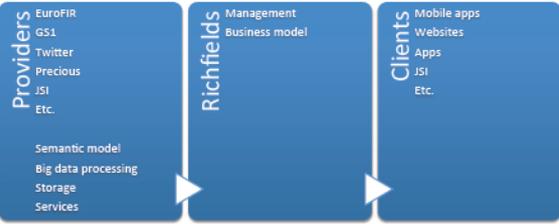
A2.4 Sign-in sheets (available on request only under GDPR)

Available on request only under GDPR



Annex 3: Parallel working groups – Discussions and Feedback

A3.1 Group 1: Using consumer-, research- & business-generated data: Information technology requirements - Tome Eftimov (JSI, SI) & Fred van Alpen (Propredict BV, NL)

<p>  Food Consumer Health <small>Designing a world class infrastructure to facilitate research</small> </p> <p> Presenter: Tome Eftimov Date: 11/12/17 Occasion: RICHFIELDS Stakeholder Workshop for Phase 3 </p> <h3>Design of the data architecture of the research infrastructure</h3> <p> Peter Korošec, Tome Eftimov, Barbara Koroušič Seljak <small>(peter.koroscec, tome.eftimov, barbara.korouasic)@jsi.si</small> </p> <p> <small>www.richfields.eu</small> #RICHFIELDS </p> <p> <small>Coordinated by:</small>   </p> <p> <small>The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</small> </p>	<h3>Concept</h3>  <p> Data Providers: EuroFIR, GS1, Twitter, Precious, JSI, Etc. Richfields: Management Business model, Semantic model, Big data processing, Storage, Services Clients: Mobile apps, Websites, Apps, JSI, Etc. </p> <p> <small>www.richfields.eu</small> #RICHFIELDS </p> <p> <small>The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</small> </p>
<h3>Concept (as proxy)</h3>  <p> Providers: EuroFIR, GS1, Twitter, Precious, JSI, Etc. Richfields: Management business model, Semantic model, Big data processing, Storage, Services Clients: Mobile apps, Websites, Apps, JSI, Etc. </p> <p> <small>www.richfields.eu</small> #RICHFIELDS </p> <p> <small>The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</small> </p>	<h3>Richfields</h3> <ul style="list-style-type: none"> • Management <ul style="list-style-type: none"> • Administration • Content • Providers • Clients • Security (SSL) <ul style="list-style-type: none"> • https://geant3.archive.geant.org/Services/NetworkPerformanceServices/Pages/GEANT_Framework.aspx • As proxy (Quisper like) <ul style="list-style-type: none"> • Provider-client communication only passes through • Business model only • As service provider (upgrade of Quisper) <ul style="list-style-type: none"> • Harmonization (ontology/taxonomy) <ul style="list-style-type: none"> • Implicit or explicit • Big data processing <ul style="list-style-type: none"> • Internal or external (as provider) • Storage <ul style="list-style-type: none"> • Centralized or distributed (each service has its own) <p> <small>www.richfields.eu</small> #RICHFIELDS </p> <p> <small>The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</small> </p>
<h3>Requirements</h3> <ul style="list-style-type: none"> • Hardware • Supported "types" of web services • Processing big data • Storing data • Harmonizing information • Type of business model <p> <small>www.richfields.eu</small> #RICHFIELDS </p> <p> <small>The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</small> </p>	<h3>Hardware</h3> <ul style="list-style-type: none"> • Software as a Service • Owned computers and data storages <ul style="list-style-type: none"> • Everything is under our control • Long term lower costs • Cloud computing and storage through service providers <ul style="list-style-type: none"> • Short term lower costs • No worry regarding hardware maintenance • Can have higher availability • Combination of above <p> <small>www.richfields.eu</small> #RICHFIELDS </p> <p> <small>The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</small> </p>

Providing/supporting web services

- With regard to
 - Provider
 - Client
- RESTful
 - HTTP based
- SOAP
 - XML based
- Mixed



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Processing big data

- Sufficient processing power
 - Efficiency of software
 - Need for parallelization
- Unlimited data plan
- Access to storage
 - Low access latency
 - High data throughput (in/out)
- What kind of data
 - (Semi-)Structured data
 - Texts
 - Pictures
 - Video
 - Signals



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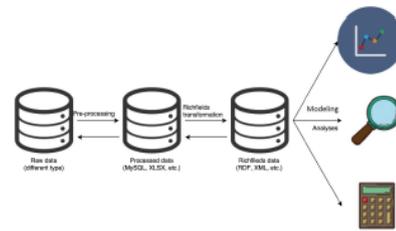
Storing data + metadata

- Storage
 - Location
 - Local, cloud, ...
 - Size
 - Data throughput
 - Access latency
- Determine data structure
 - Format in which data is stored
 - FAIR (<https://www.force11.org/fairprinciples>)
- Which software to use for storing data
 - Type of data + metadata
 - Frequency of storing
 - Frequency of reading
 - Types of searching (simple or complex)



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Harmonization of information



1. RICHFIELDS Semantic model
2. Extracting information and mapping it to RICHFIELDS Semantic model



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Business model

- What kind of business model (WP12)
 - Pay
 - Free
 - Open Science Cloud
 - https://ec.europa.eu/research/openscience/pdf/realising_the_european_open_science_cloud_2016.pdf#view=fit&page=mode=none
 - Etc.



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Case studies

- Proof of concept
- Real-world implementation
- Somewhere in between
- Use of results from previous projects
 - Quisper



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The basis assumption was made that RICHFIELDS acts as a proxy, were provided data stays where it is (with the owner) but made available to connect and be uploaded for publication/data manipulation/data enrichment and taking into the metadata.

Then, in certain ways, parts can be uploaded to a central node with aggregated/metadata data.

As customer I then think about issues like:

- Data quality: It goes without saying that as a customer I want the guarantee that the data is true, representative and of good quality.
- Performance: As a potential user I have certain subjective expectations about the time it takes to receive my data selection. Depending on the complexity, diversity or sheer volume this can be challenging. As customer I want to know on beforehand what can be expected in ways of size and response times. So before finalizing my data request I like to have information about expected time for enclosing the requested data.
 - i. Depending on acceptance, the infra-structure needs to be able to deal with that to be successful.
 - ii. In not accepting the waiting time, As a customer I want to be advised in how I can be more effective in filtering/selecting/combining the data, to lower the waiting time.
- Data availability: As customer I don't want to download the data physically, or I want to have the data local on my own environment. Richfields need to make a choice there what is possible, because every choice has consequences for broadband, storage, etc.
 - i. But as data user I like to have the opportunity to choose to store (download) the data local, keep in the cloud.
- Data enrichment: Elaborating on the former topic, As a data user I might like to enrich the data I selected and store this enrichment. In this think about additional calculations on the selected data that I want to do more often and don't want to re-invent the wheel every time.
 - i. As a customer I want to have the option to local, or central enrich my data selection and store it for future use.
- Energy: As being a "semi"-governmental institute I want to be green. So as potential user I want Richfield to be environmental aware in the way it stores and stream data and use energy for this.
- User dashboard: Given that there are different persons as customer/consumers, as a customer I want to be guided in my selection for data, based on my level of skills and knowledge of data selection. In this think about a dashboard with decision tree possibilities, or easy question technology to be translated into a query.
 - i. As a customer I do not want to need to search for a needle in a haystack.
 - ii. This asks the platform to deal with the diversity of customers, persons and flexible functionality to search/select the data in a way that suits me. This needs to be tested with the active potential person customers.
- As a customer I want access to have access, guidance, support in the understanding what data is available and what the data stands for. So despite that I might not understand the concept of meta data, I should be able to understand what data I need given my needs for certain data. Discussions went already into solutions were a need evolved in intelligent dashboard, or decision trees. Preferably graphical.

A3.2 Group 2: Ethical, legal and societal issues: Framework for practice - Javier de la Cueva (Consultant, ES) & Wilke van Ansem (ZonMW, NL)

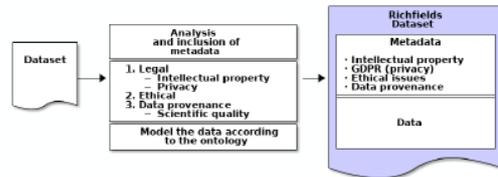
<p>Richfields Food Consumer Health Designing a world-class infrastructure to facilitate research</p> <p>Presenter: Javier de la Cueva Date: 12/12/17 Occasion: Stakeholders' Workshop 3 11-12 December 2017 Brussels, BE</p> <h3>Ethical, legal and societal issues: Framework for practice</h3> <p>www.richfields.eu #RICHFIELDS Coordinated by Wageningen Economic Research: WAGENINGEN UNIVERSITY & RESEARCH</p> <p><small>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 654280.</small></p>	<h3>Questions to be discussed</h3> <h4>General questions</h4> <ol style="list-style-type: none"> 1. Typical user of a consumer data platform is Consumers (as data providers) Industry (as data providers) Researchers (as data providers) Industry (as data users) Consumers (as data users) Researchers (as data users) <p>As a consumer (data provider)</p> <p>→ I want trust, transparency & togetherness</p> <p>→ so that I can be confident my data is being used as I wish, I benefit from knowing how it has added value to society and I feel a sense of belonging to a community</p>
<h3>Specifics to be discussed</h3> <h4>Anonymisation/Privacy (GDPR)</h4> <h4>Ethical issues</h4> <ul style="list-style-type: none"> • Consent vs informed consent • Re-purposing data <h4>Governance</h4> <ul style="list-style-type: none"> • Risk management • Gate keeping <p><i>What does this mean for the governance model?</i></p> <ol style="list-style-type: none"> 1. What would your main concerns be as a user of the platform? 2. What would your main concerns be as a consumer providing data to the platform? 	<h3>What does this mean for the governance model?</h3> <ol style="list-style-type: none"> 1. What would your main concerns be as a user of the platform? 2. What would your main concerns be as a consumer providing data to the platform? <h4>Funding body</h4> <ul style="list-style-type: none"> • Privacy issues and ethical compliance is of paramount concern <h4>Industry</h4> <ul style="list-style-type: none"> • How the cost models will be implemented to ensure fair access to data. • The possible impact of a media exposes on re-purposed data (fake news), how do they control how their is used n(unintended consequences) • Protection of intellectual property (control should be introduced via metadata) <h4>Researcher</h4> <ul style="list-style-type: none"> • That the data utilised via the platform complies with scientific publication requirements in terms of ethical consent and legal compliance. • That funders accept the Richfields dataset as compliant both ethically and legally
<h3>What does this mean for the governance model?</h3> <ol style="list-style-type: none"> 1. What would your main concerns be as a user of the platform? 2. What would your main concerns be as a consumer providing data to the platform? <ul style="list-style-type: none"> • Privacy/anonymisation is critical • Transparency/visibility of how the data has been used and re-purposed (i.e. appropriate controls in place) • Cannot envisage the impact of data (possibilities for negative impact on vulnerable groups/personal identity) • What happens when data is misused (how will it be addressed?) 	<h3>What does this mean for the governance model?</h3> <ul style="list-style-type: none"> • Ethical guiding principles to be set to control data can be used and re-purposed (these will evolve so need a transparent decision path) • Metadata should address legal (IP & Privacy), Ethics and provenance • Transparency is a must • Risk management and gate-keeping is a fundamental role of the RICHFIELDS governance model • Assembly of private, public and Commons is essential in the Governance model (Transparency and representativeness) • RICHFIELDS must be legal entity, have public liability insurance in place to be able to act on those that misuse data. • Representation of citizen science/consumer panel to debate future ethical issues and their inclusion into the guiding principles. Could include an Ombudsman (independent person) to protect consumers position and representation.

The big picture



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Detailed activity per dataset



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Contributions to this document from:

- Wilke van Ansem
- Maartje van den Berg
- Marc-Jeroen Bogaardt
- Javier de la Cueva
- Charo Hodgins
- Klazine van der Horst



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A3.3 Group 3: Using consumer-, research- & business-generated data for research: Envisaging the future – innovation, citizen science and other breakthroughs - Bent Egberg Mikkelsen (AAU, DK) & - Birdem Amoutzopoulos (MRC UK)

Richfields Food | Consumer | Health
 Date: December 11, 2017
 Duration: 3rd RF stakeholder meeting

**Group 3:
 Using consumer-, research- & business-generated data for research: Envisaging the future – innovation, citizen science and other breakthroughs**

Bent Egberg Mikkelsen
 3rd RF stakeholder meeting
 December 11 – 12, 2017, Brussels

Abstract: How can innovation and citizen science be used to collect and communicate data and knowledge about food, nutrition & health in a future research environment that has not been identified by consumers, researchers and businesses. The presentation is a pitch for a discussion on envisaging the future knowledge needs. It was inspired by the Richfields study and from best practices of citizen and consumer science at the Massachusetts Institute of Technology. Topics for the following meetings: 1. How citizen supported data share projects could look like. 2. How new digital devices can be co-created. 3. How the experiment can be taken to the street and 4. How science can be communicated to citizens

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Why Big Food – what we don't know
 Stakeholder Views on Big data food data analytic and "Food & the digital"

"We have so many data we don't know what to do with them"
 Chief Data Analyst, Major Danish Retailer

"Your idea of a digital data platform is the future but you need to come back in 2 years."
 Deputy director, UK Government Food Agency

"Something is rotten in the state of the retail sector. Its changing but we don't know how. What we know is that its digitally driven"
 Major Danish Market Intelligence Bureau with inspiration from Shakespeare

"Why don't you do a couple of use cases"
 Plenary discussion at Nordic Richfields stakeholder WS, Oct 3 Lund

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Creating citizen science – a new multistakeholder data sharing economy?

Actor	Give	Benefit
Consumer	Data from loyalty cards or Smartphones	Food back on behavior compared to recommendations Food back on behavior compared to other families
Researcher	New analytical approaches	New research questions to be answered New analytics based on AI and ML
Retailer	Data on consumer behavior	Realtime data on consumer behavior New groups
Manufacturers (MS)	Data on food composition, provenance etc.	Direct digital interaction New groups

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My agenda

1. How a citizen supported data share project could look like
2. How new digital devices can be co-created
3. How the experiment can be taken to the street
4. How science can be communicated to citizens

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Adding from policy documents

1. Be open
2. Share
3. Re-use data
4. Co-create
5. Tie-up digitally

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Smart Data, Smart Food & Smart City

CITY DATA EXCHANGE

Urban Food Living Big Data

- Use of the Urban Living Big Data (ULBD)
- Regional digital platform (RDP) to connect
- European Big Data analysis on the ULBD
- Research with a personal plan since RDP
- Precision (ULBD) with real-time monitoring that data
- Ready for the Urban Food Strategies (RFD) 2017
- A platform, address to Open/Urban Data 2017

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Smart sensing of canteen flow

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From FoodScapeLab to Street Food Science Researchers festival & culture nights

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And now to the group work

- Typical user of a consumer data platform is ...
- As a <type of user>, I want <some goal> so that we can <some reason>
- Typical user of a consumer data platform is SCIENCE JOURNALIST
- As a SCIENCE JOURNALIST, I want INTEGRATED ASK THE PROFESSOR DATA SERVICE so that we can DO EVIDENCE BASED SCIENCE JOURNALISM

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Example: Abundance matters experiment

TABLE 1	NAME OF VEGETABLE	WEIGHT BEFORE (gms)	WEIGHT AFTER (gms)	CONSUMED AMOUNT (gms)
	Tomato	1000	753	250
	Pine	1000	600	400
	Carrot	1000	800	200
	Total	3000	2414	586
	Average	1000	813.33	194.67

TABLE 2	NAME OF VEGETABLE	WEIGHT BEFORE (gms)	WEIGHT AFTER (gms)	CONSUMED AMOUNT (gms)
	Tomato	500	46	452
	Pine	500	369	131
	Carrot	500	209	290
	Celery	500	389	111
	Cornichon	500	301	199
	Pepper	500	275	225
	Total	3000	1689	1318
	Average	500	278.17	221.83

RichFields www.richfields.eu
Courtesy of Gail Pank, London, UK

Refining Food'n Science components at Aalborg Universitarium summer 2017

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Continuity of Richfields.

- Assistance to recruit people
- Access to people.



I'm part of the ^{science} community!



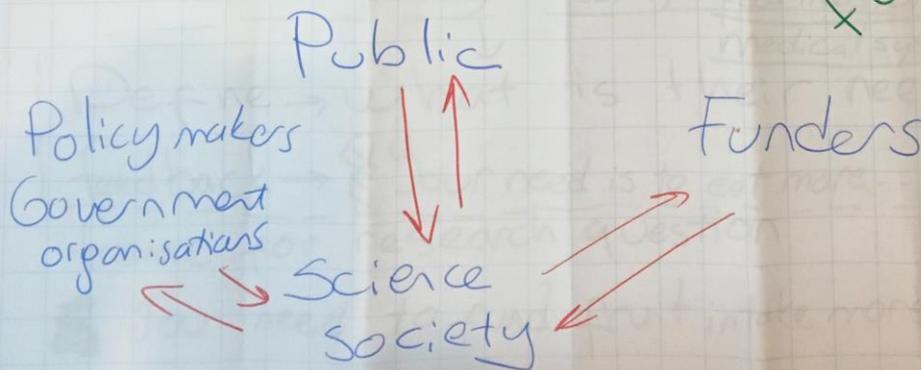
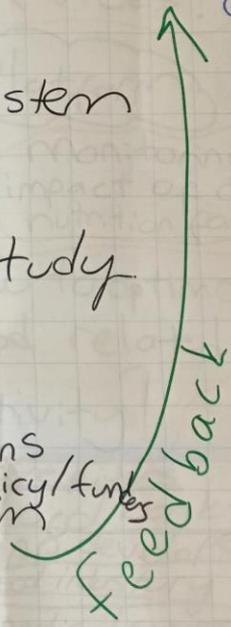
- Register to the system

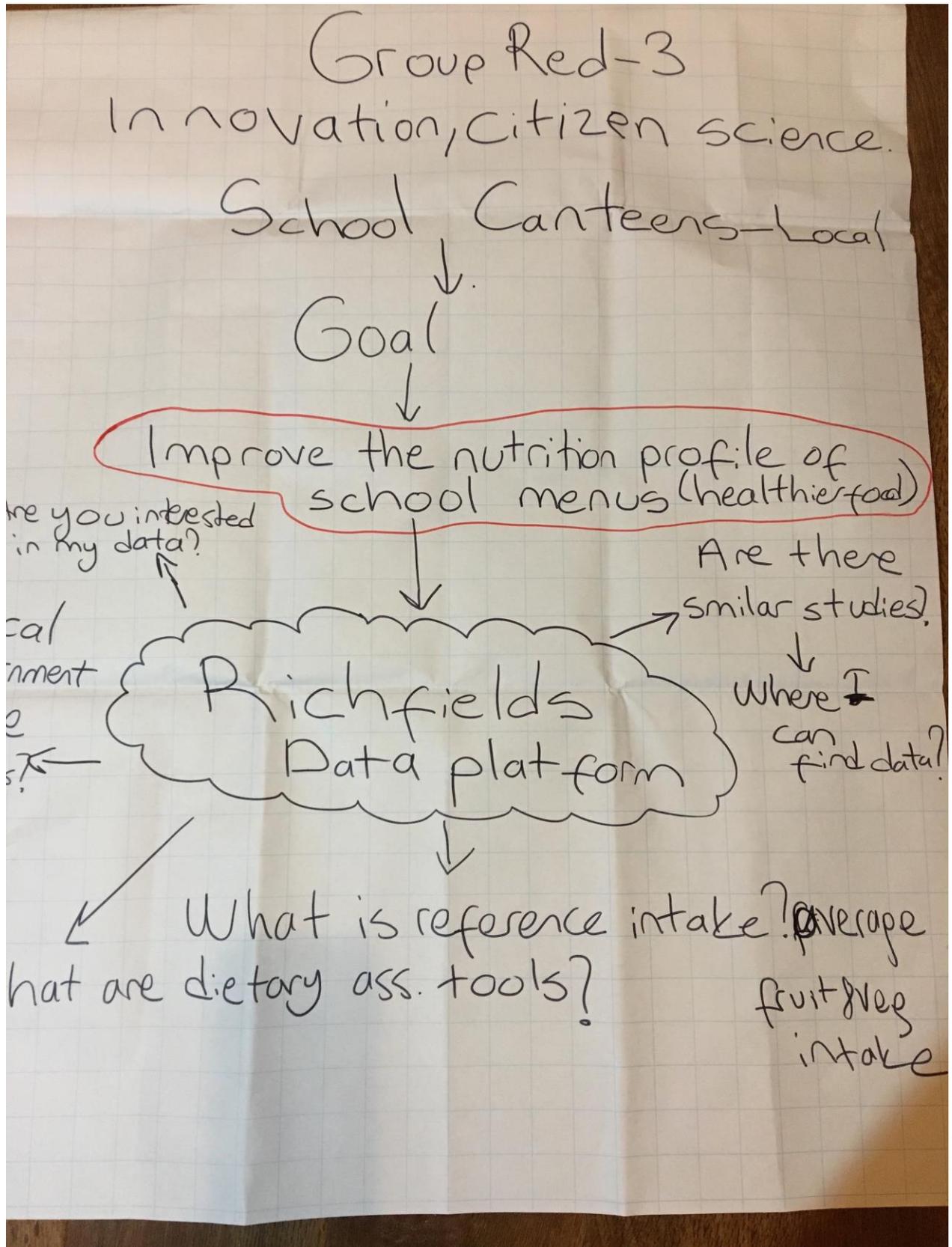


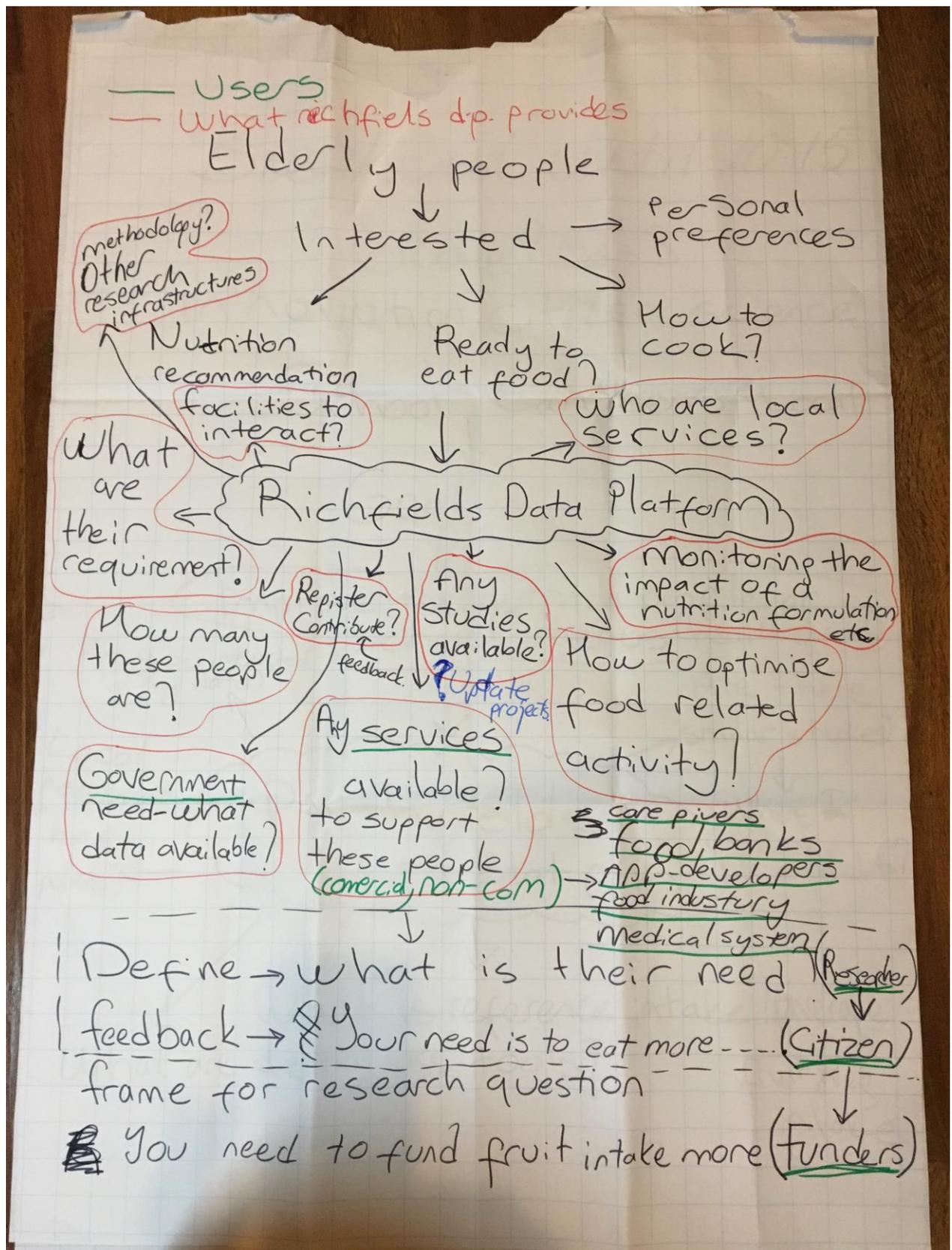
- Take part in the study



Process
Study - Outcomes
- Recommendations
↓
Stored in system → Policy/funders







A3.4 Group 4: Business model of RICHFIELDS: value propositions, key suppliers and key activities - Golboo PourAbdollahain (CNR, IT) & - Luca Bucchini (HYLO, IT)

<p>Richfields Food Consumer Health Designing a world-class infrastructure to facilitate research</p> <p>Presenter: Golboo PourAbdollahain Date: 11/12/2017 Occasion: 3rd Stakeholders Workshop</p> <h3>RICHFIELDS Business Model</h3> <p>www.richfields.eu #RICHFIELDS</p> <p>Coordinated by Wageningen Economic Research: WAGENINGEN UNIVERSITY & RESEARCH</p> <p>This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 654280.</p>	<h3>Final business model of RICHFIELDS at maturity phase</h3> <h4>Who will be the final customers of RICHFIELDS?</h4>  <p>Customer segments</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 5px; background-color: #4a7ebb; color: white;">Researchers</div> <div style="border: 1px solid black; padding: 5px; background-color: #666699; color: white;">Policy makers</div> <div style="border: 1px solid black; padding: 5px; background-color: #cc3333; color: white;">Businesses</div> <div style="border: 1px solid black; padding: 5px; background-color: #669933; color: white;">Consumers</div> </div> <p>www.richfields.eu #RICHFIELDS</p>
<h3>Value proposition</h3> <p>BUSINESSES</p> <ul style="list-style-type: none"> • Access to aggregated high-quality integrated data set (?) • Possibility to inking own data to other dataset and thus increase of data sales • Consultancy & data analysis • Training services on how to use protocols, semantic data models, data analysis methods, etc. • Networking and create new business opportunities by establishment of links between business and research, data suppliers and data users • Develop applications aligned with RICHFIELDS protocols and get a quality label (for app developers) • Becoming socially responsible and complying with CSR rules <p>www.richfields.eu #RICHFIELDS</p>	<h3>Key activities</h3> <ul style="list-style-type: none"> • Identification of valuable data sets and suppliers (researchers, research infrastructures, privates and app developers) • Negotiation with suppliers and agreements setting (on data use or data interlinking) • Data quality assessment • Collection and harmonisation protocols definition • Consulting on quantitative research (datasets setting, data analysis and interpretation, state of the art, identification of experts on specific research questions, ...) • Elaboration of thematic/periodic reports • Customer relationship management • Platform running • Legal and ethical supervision of platform • Communication activities <p>www.richfields.eu #RICHFIELDS</p>
<h3>Discussion & Use cases</h3> <p>As a RESEARCHER:</p> <ul style="list-style-type: none"> • What services do you expect from RICHFIELDS RI? • What could RICHFIELDS offer to you that you don't find in other existing RIs? • Under which conditions you exchange your data with RICHFIELDS? • How much are you willing to pay to receive RICHFIELDS services?  <p>www.richfields.eu #RICHFIELDS</p>	<h3>Discussion & Use cases</h3> <p>As a Food manufacturer/App developer/Retailer/Data panel company/etc. :</p> <ul style="list-style-type: none"> • What services do you expect from RICHFIELDS RI? • What could be the motivation for you to join RICHFIELDS? • Are you interested to have access to data or to data-oriented services (i.e. data analysis, consultancy, etc.)? • Under which condition you are willing to exchange your data with RICHFIELDS? What you expect in return? • How much are you willing to pay to receive RICHFIELDS services?  <p>www.richfields.eu #RICHFIELDS</p>

Discussion & Use cases

As a consumer/citizen:

- What kind of services could be interesting for you to receive from RICHFIELDS?
- Are you willing to share your data through RICHFIELDSD app? What do you expect in return?



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Discussion & Use cases

As a Policy maker:

- What are the short-term and long-term benefits do you expect from RICHFIELDS?



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Discussion

- Key activities are complicated, think small
- It's about Complexity and focus
- Need to align the story to clarify FNH, RICHFIELDS, Consumer platform

Focusing on business :

- Every company is different and → sub business models for different businesses
- We need to make it a co-creation platform so companies can share their data to co-create the RICHFIELDS platform
- Collaboration instead of competition
- Social innovation
- Build the platform from the beginning including the business perspectives, They should be partners



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Discussion

We focused on business:

- Do they need data or data-generated services? Both depending on the company
- Companies don't know what to do with their data
- Role of richfields? Richfields as a facilitator
- Does RICHFIELDS offer research and data analysis services?
- Use research partners of richfields to provide services to business
- Richfields guarantees a certain level of data quality
- What can RICHFIELDS provide to customers? Richfields offers expertise and knowledge to its customers
- Training services
- Who pays for that? We have the public funds but we need to have a sustainable business model in long term.
- Important role of national nodes to make an effective communication



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Parallel discussions: Group 4 Business

2017-12-11 Present: Luca Bucchini (LB), Hennie van der Veen (HvdV), Paolo Colombani (PC), Maria Glibetic (MG), Siân Astley (SBA), Karin Zimmermann (KZ)

KZ presented the introduction

LB: having understood what RICHFIELDS's is about, it is exciting and innovative but, if it is so good, this is already being done in the private sector. Has RICHFIELDS looked? Isn't the most valuable aspect already being done by someone else and, if not, is it because it is too difficult?

PC: Apple is already collecting such data, as is FB and Google. Data are being collected and used by these companies. RICHFIELDS is a brilliant concept, but so huge it is difficult to grasp, which makes it difficult to sell. EC recognises the value but, the moment you have to sell, it becomes problematic. There is also the matter of cost and profit, e.g. even SMEs that might be interested in the data make up a huge number of companies. Initially, there may be a need to identify who and what very narrowly to enable take up.

MG: what is the unique selling point that will encourage consumers to participate? RICHFIELDS needs to be transparent in terms of what is and what is not available. It also needs to be recognisable as an entity. Huge conglomerates have many resources at their fingertips; they do not use scientific sources, preferring trustworthy 'grey' resources including their data (trusted because consumers recognise the brand, not necessarily because it is scientific). RICHFIELDS USP is the scientific validity of the data, tools and services, and potentially transparency in its function. RICHFIELDS needs to be more specific about what data from where will be included.

PC: EuroFIR, for example, had to consider what and for whom, despite its very limited scope (food composition data). One option might be to get marketing people to look at the plans and position the outcome.

SBA: explained the current disconnect (use case building blocks at one end and the functioning platform at the other), and how this makes grasping the concept more difficult.

KZ: explained that RICHFIELDS is a research infrastructure (RI) that must bring research outcomes, e.g. identifying new issues within Europe that might become a social burden, as related to food. We need to keep Member States (MS) on-board for continuity of funding, as funding will not come from – for example – the European Commission in the longer term. It is also challenging to involve industry, as a potential source of funding. Value proposition is to explore the determinants of behaviours around food using big data.

LB: RICHFIELDS is about combining data not using the data for research?

KZ: RICHFIELDS aims to design a consumer-data platform and identify potential sources of data for use by research; not to determine how the data are used subsequently. It is about providing supporting meta-data and facilitating exchange and sharing.

LB: if asked, if might want to share my data provided I could choose what, but that is not happening yet.

KZ: no, but that might be because those who could use these data have not recognised the value in these data or data from their systems that might be used for research.

LB: perhaps RICHFIELDS needs to be talking to potential users, e.g. App developers?

KZ: we are having those conversations and they preference is for reliable evidence based accessible data. Some drivers have been identified, e.g. corporate social responsibility.

LB: but it is up to RICHFIELDS to demonstrate the benefits it offers, which may persuade some to participate. However, it is up to RICHFIELDS to make the argument for users at both ends.

KZ: explained her concerns around a business model that is sustainable but also seen as cost effective by users, such as the industry. She also explained how SUSTRANS and other projects are using data sources to create frameworks/ networks of information that can support evidence-based outputs. One area that is lacking, however, remains behaviours, which is why RICHFIELDS is so important and potentially this is RICHFIELDS's USP. She also explained how the Netherlands is starting to align research cohorts to enable cross-comparison of outputs.

2017-12-12 Present: Luca Bucchini (LB), Paolo Colombani (PC), Maria Glibetic (MG), **Siân Astley** (SBA), Karin Zimmermann (KZ), Paul Finglas (PF)

PF: described projects that are looking at alternative business models rather than the more conventional commercial structures

KZ: Dutch Health-RI has now opened up activities for public scrutiny. She summarised the customer segments for the FNH-RI, including RICHFIELDS. Based on these, activities can be identified, such as data supply or use, but these are complex especially for the mature platform.

PF: Large tech companies collect data and are, therefore, difficult to engage with. For RICHFIELDS, we also need to ensure access of across at all commercial levels to preserve scientific credibility, perhaps by promoting pre-competitive approaches/ collaboration.

KZ: food industry is an interesting customer, but also very different from the perspective of participation compared with tech companies.

PC: what is it that differentiates RICHFIELDS? Why would organisation come to RICHFIELDS since many will have consumer data?

KZ: it is true that companies have consumer data but often in isolation (e.g. geographically, customer profile), and the need for cooperation and sharing data requires a change in culture.

PC: RICHFIELDS may be able to act as a neutral third party for sharing data

KZ: the aim would be to build the platform from the perspective of business, since nothing currently exist on a wider scale, beyond individual companies, countries, sub-populations.

PC: are business interested in data, services or both?

MG: depends on the business; some will want data whilst others will want the analysis done for them because they do not have the expertise.

KZ: most food businesses have no clue what to do with their data; however, RICHFIELDS does not aim to do research per se, but provide an environment where research can be done.

MG: if a business asks for aggregated data and outcomes, why not facilitate this rather than arguing that RICHFIELDS does not do research?

KZ: better to facilitate links with a partner(s) rather than doing the research directly

MG: there needs to be a smooth process; anything that is complicated will put off potential customers; the transfer of support needs to be seamless.

PC: one of the issues will be agreement about what is shared and how. It will take years to agree formats, etc.

PF: RICHFIELDS need to determine what sort of data will be included at the start.

PC: it is about understanding your customer(s) and getting more and more accurate and personalised services for individuals.

LB: this assumes there are datasets that can be shared. The incentives for sharing and linking data are not clear; there is a clear benefit of this for research and other sectors, but not necessarily for the larger company.

KZ: some companies are already negotiating to open up data for SMEs and start-ups

PC: it is not enough to have data; these data need to be harmonised and supported by appropriate meta-data

SBA: something that has not yet been achieved with our (EuroFIR) compilers, and there are only 28 of them not the 100s of potential sources of consumer- and research-generated data.

PF: there is some standardisation and we (EuroFIR) have made progress, but it is unlikely that RICHFIELDS will achieve standardisation but rather coordinate it.

KZ: RICHFIELDS guarantees some level of quality (datasets) and validity (tools)

PF: needs to be aware of the wider environment because it also opens up opportunities

KZ: there will be an increasing drive to share research data, particularly publically-funded

LB: interaction between the more flexible fast-moving start-ups and bigger companies is an exciting prospect, but who is paying for this? The big companies or the SMEs or someone else?

PF: especially where there is public funding; large tranches of the data are public, the skill is in knowing what can be done with the data to add value, e.g. aligning data making it comparable. RICHFIELDS has to start with R&D/ academia and industry, which can be sub-divided into smaller groups of likely customers and activities grown on this basis.

SBA: asked the group to identify who is the typical user of RICHFIELDS?

ANSWER: Developers & Food industry

KZ: suggested the most typical one would be the food industry including SMEs

It was agreed that start-ups would not be typical users.

PF: asked what a food manufacturer would want from RICHFIELDS that they do not already have

KZ: suggested the expertise linked to the datasets, knowledge and research environment

LB: what would they ask for?

KZ: companies want to be more sustainable, e.g. they want to increase margins and understand the dynamics of the market, which means they have to address consumers' needs, e.g. understand better how they can combine consumer choice for sustainable food chains and health at the point of purchase and adapt this knowledge to products and sales.

LB: why RICHFIELDS and not directly Wageningen Research, for example?

KZ: RICHFIELDS can broaden the scope and be more efficient in delivering the outcomes.

LB: that is not entirely convincing because 'interpretation' is required in understanding these data and the meaning behind the behaviours. The more obvious provider is WUR.

KZ: it is the collection of data and the manipulation around issues of interest, e.g. sustainability, health and specific sub-populations interest and take-up

PC: not sure it is true that companies know who where to go for that information currently.

PF: reminded the group that current ESFRI RIs do not have a sustainable business model, which still presents issues in the design and delivery of RICHFIELDS.

Annex 4: Typical user of a consumer data platform

A4.1 Who is a typical user of a consumer data platform?

Typical user of a consumer
data platform is ...

- Group 1: Someone who can find data in their own fashion, based on their knowledge and skills about data collections
- Group 2: Consumers, Industry and Researchers, as data providers and users
- Group 3: Science journalist
- Group 4: Researcher

As a ...

- Group 1: Data user
- Group 2: Consumer data provider
- Group 3:
- Group 4:

I want ...

- Group 1: An intelligent user-friendly graphical dashboard
- Group 2: Trust, transparency, togetherness
- Group 3:
- Group 4:

So I can ...

- Group 1: Easily select my data without having to put a lot of energy into data understanding
- Group 2: Be confident my data are being used as I wish; I benefit from knowing how my data has added value to society; I feel a sense of belonging to a community
- Group 3:
- Group 4:

A4.2 Individual responses

A4.2.1 M26 Consortium meeting: RICHFIELDS Beneficiaries

Overview: It provides information on all relevant data sets that are available for me (and what the conditions are to use it).

Exclusive: It gives me access to data I cannot have access to any other way.

Up to date: the information is always up to date and frequently updated.

Quality controlled: It assures that all data is scientifically validated, trustworthy, ethical, evidence based and standardized.

Community: It makes it easy for me to connect to other researchers that can be relevant for me.

Easy to use: it is very easy to use and accessible for everyone. It gives me fast access to relevant data in easy to use formats.

Support: it supports me in tools on how to use the data and presents expertise in collecting, using and analysing data.

A4.2.2 Responses from external delegates

Typical user of a consumer data platform is ...

1. An academic researcher interested in generating knowledge to help address societal issues associated with food consumption and its impact on health
2. There is no typical consumer, but some general features could be: interests in food- and nutrient-related information and knowledge; search for *** and reliable data, information sources and SOPs; interest to act/ *** as consumer to initiatives impacting 888 (societal) food and nutritional status or environment
3. Someone who needs data related to food and health in order to obtain *** results
4. Someone who is in of easy, quick tailor-made data that represents their required sample
5. 40 year old in 2020 heading towards my mid-life crisis; my kids are tell me that I need a life-style change; After some hesitation, I have accepted the idea that I want to change to become more agile and my BMI back to a safe operating space; I have bought a bike, signed up with a local fitness club, reflected on what diet is best for me and my family, carved out time for responsible shopping and for cooking; we have started to grow some vegetables and lettuce at home and we buy much more of them than previously, preferably local and organic; food and exercise have moved up higher on my agenda, as I am well aware that it is a single solution that will me there
6. Researchers; policy-makers; health systems manager; surveillance systems; nutritionist; caregiver organisations; associations; NGOs; retailers; food industry; business manager; marketing companies; food chain actors; producers; transformer; caterers (HoReCA); consumers; citizens
7. Commercial research/ advisory/ data company, such as Euromonitor, Nielsen and McKinsey
8. If it is general consumer data, a typical user could be a market researcher who wants to collect and analyse food topic of interest in Europe; if it is more research focused, the typical user will more towards academia; user/ typical user will depend on the data/purpose of the platform
9. Science community; commercial and non-commercial services (industry, charities, organisations); Government organisations, policy-makers; research funders; members of the public/ individuals
10. Researchers and research-based spin-off companies, small and medium size enterprises, food- and nutrition-knowledge driven individuals
11. Anyone who makes decisions on nutrition and food (policy-makers, industry, researchers, organisations, consumers)
12. Scientists, interested public, policy-makers, app developers, industry (supermarkets and food producers), journalists
13. Academic researcher on consumption
14. Researcher from public and private bodies, as they want to explore new data with limited budget and effort to analyse and conclude on innovative topics and research questions that will contribute to massive societal challenges; researcher can be from a broad set of disciplines (consumer scientist, economist, livestock breeding, product developer), as the consumer is the carrier for new innovate, public health or nudging strategies
15. Food consultant
16. Technology skilled, familiar with electronic devices, passion to compare results with other users
17. Researcher working at a university who needs data on food, nutrition and health to analyse and answer research questions
18. An SME
19. Business entities (developers, food manufacturers, retailers, data panel companies, private market research companies)
20. Access to data to run statistical analyses, retrieve consumption data about specific foods, dietary patterns, countries and populations; download data to feed into models or run other analyses; access to data through a software app to obtain information on best diet patterns and nutritional advice.
21. Researchers, policy workers, food manufacturers looking for data on nutritional trends

Q2a. As a ...

1. Academic consumer science researcher
2. Nutritional epidemiologist
3. PhD student (researcher) in computer science
4. Researcher
5. Waking up I heard about personalised nutrition on the radio; my kids talked about the RICHFIELDS platform, which they learned about on social media; there are some really cool and citizen-centred apps coming with it they said; I started to think how this could help me in my daily life since my dietary wake-up call; I am eating a lot of fresh stuff and whenever possible I buy non-processed food; I have stopped snacking, except fruit and I do not miss it.
6. Nutrition data manager (design, collection, processing, delivering and training)
7. Commercial data/ strategic research company
8. Researcher in industry research and development (not marketing research)
9. Food composition database manager
10. Researcher in the field of food and nutrition
11. Nutritionist in research and policy-making
12. Scientist, public, policy-maker
13. Academic researcher in the consumer domain
14. Researcher with expertise in 'strategic marketing'
15. Regulatory, technical and scientific consultancy
16. User with different *** of data
17. Health researcher working at a university
18. SME food manufacturer
19. Food manufacturers (a) large, (b) SMEs; app developers
20. User or mathematician working with food consumption data to assess exposure to food hazards
21. Dietitian

Q2b. I want ...

1. Access to high quality, well-described data (meta-data) on intake of foods, food environment and determinants associated with intake
2. Access to up-to-date inventories on diet activities in Europe; dietary and *** lifestyle data in Europe (well documented catalogue on meta data); dietary tools and SOPs; European and nutritional strategic plans
3. Data on food consumption and composition from three selected countries
4. Have direct access to consolidated data in a flexible manner
5. My approach to what is best for my next meal is more intuitive than evidence-based; having a self-learning tool at home to provide contextual decision support could be a great idea, in particular when I am in the kitchen with my hands wet and oily; what I would need is precise information and options for my next healthy meal and healthy purchases, based on my previous intakes, my exercise and availability close by. I want my food to be healthy and be good also for my moral health; I will sleep better if I know my supply chains are clean without worker exploitation or child work, and my food is not harming the planet to be passed on to our kids
6. Design – current background for estimating parameters, choosing methods; collection – frameworks, tools, facilities (e.g. questionnaire translations, validation, etc.); delivering – who might be interested in the results; training – updated information on current knowledge and beliefs and requirements – sources of validated *** (WHO, EFSA, etc.)
7. Easy accessible and cheap access to as much data as possible without liabilities towards the data providers, and secure quality data sources (which is never discussed with respect to quality)
8. Have access to the microdata and be able to link various data sources, e.g. real-time consumption data app location
9. Know how I can access up-to-date food composition data of products in the supermarket
10. Use RICHFIELDS databases for further data analyses because I trust the data quality
11. Better data, sensitive data, specific data, verified data that reflect current challenges
12. Investigate consumption and behaviour of consumers; how often certain foods are consumed; investigate which components are over- or under-consumed; investigate consumption in specific regions/ among specific groups; write an article with some fundamental facts about consumption
13. Access to open access data
14. Combine evidence-based data as much as possible coming from different sources, countries and perspectives
15. Data and services on food intakes, composition, linked to markets data, health determinants and real-time data
16. Be helpful in improving the performance [of RICHFIELDS] and discuss experience with others (types of data, benefits)
17. Access to consumer data on food, nutrition and health of good quality
18. Understand better why my customers (1) buy my products, (2) non-consumers (those who do not buy my products, yet)
19. Have access to specific high quality datasets that are not integrated; have my data and other relevant datasets analysed and give specific answers to my questions; receive specific insights, consultancy, market research services; have analysis of data to improve my products
20. An easy way to query and download data, calculate summary statistics, and obtain data visualisation (e.g. charts)
21. Epidemiological data on food, related to disorders and their links to food consumption

Q2c. So, I can ...

1. Generate new knowledge and inform policy and public level interventions to address the societal issues (food-related chronic disease) related to diet
2. Conduct research and foster collaborations in Europe, considering needs and priorities in the food and health domain
3. Test a new food matching algorithm
4. Efficiently work on publications without losing time collecting data
5. There are moments when minutes count so, if I am in a hurry, I use my new three-D printer to produce a healthy meal; I know some of this can be really challenging for my new digital assistant; I also realise the technology to make work would need data from many different sources, including my personal microbiome; if it worked I could consent to crowd-donate my data; sometimes I wonder about the energy needed to stock and process all these data; I do not like broccoli but my tool is smart.
6. Manage formal and influential source of information to develop further studies; formal: official scientific databases, informal: news, newsletters, blogs, posts, etc.
7. Use and resell the data and or aggregates based on it (reports/ research/ strategic advice) to make money from this service
8. Analyse or commission analyses that are of interest to me
9. Get in contact with retailers through RICHFIELDS and request data and probably get it more easily because RICHFIELDS already has an agreement with these retailers
10. Support my existing research or to do new research or prepare systematic data research using harmonised and research-based information
11. Contribute data on vulnerable population groups
12. Select dataset, age groups and components of interest; distribution of certain foods in countries; compare consumption to average daily intake, group data according to region or country; compare amounts of foods purchased to foods consumed; get summary high-level data
13. Use these data instead of collecting it myself
14. Combine, extract and analyse new relationships that quickly direct my insights in my area to new directions, thoughts or new relationships that effect consumer behaviour, lifestyle and product development
15. Provide information to the food industry and regulators on food, diet, health behaviours by health status, behaviour, country, product, etc. (reports), e.g. what foods are over-weight people aged 20-30 eating in Italy compared with France? Are food supplements with magnesium used by people with cardiovascular disease?
16. Communicate with relevant people in the field
17. Answer my research questions
18. Better tailor communications about my product; give added value to my product or even modify my product
19. Have access to wider data to improve my products, develop new products, produce customised products for specific customer groups; improve and develop products and service, develop innovative products; improve my products and services to develop new features
20. Run models or statistical analyses on the data and combine them with other databases, such as pesticide concentrations in foods
21. Understand better the link between foods consumed and health conditions to give better nutritional advice

Annex 5: Questions and Feedback

A5.1 Plenary – Discussions and feedback

Research infrastructure on consumer health and food intake using e-science with linked data (RICHFIELDS): Workshop 3 - Envisaging a consumer data platform (Siân Astley, EuroFIR AISBL)

14:15-14:30 General partner introductions & Aims and objectives for the workshop

see 2017-12-11 RICHFIELDS WS3 Welcome SBA

SBA welcomed everyone and thanked them attending, and asked delegates to introduced themselves (name, organisation and whether they were from a RICHFIELDS beneficiary or not).

Those delayed or were unable attend due to the weather were: Simon Haafs (i3B, NL – unable to travel from the Netherlands); Maria Kapsokefalou (Agricultural University of Athens, GR – redirected to Dusseldorf); Aida Turrini (CREA-Alimenti e Nutrizione, IT – redirected to Luxembourg); Javier de la Cueva (Independent Consultant, ES – redirected to Liège); Paul Finglas (delayed in Norwich and Schiphol); Golboo Pourabdollahian (Institute of Industrial Technologies and Automation, IT – redirected to Liège); all redirected or delay delegates arrived late afternoon or the evening of 11th December 2018.

Apologies were also received from Damian O’Kelly (Nutritics, IE) and Maria Romeo-Velilla (EuroHealthNet, BE) and Kerstin Lienemann (German Institute of Food Technologies, DE).

14:30-15:00 Wider food, nutrition and health landscape (science vision and mission)

Karin Zimmermann, Wageningen University & Research NL

See 2017-12-11 FNH RI introduction KZ

Questions were asked about the need for separate platforms for each aspect and the need for access to tools; KZ explained that the FHN RI should bring resources together not replace them. Further, that tools and services are an integral part of the RI supporting research not doing it.

Marc-Jeroen Bogaardt asked about the plans to incorporate the food aspects of sustainability health and quality and animal welfare, etc. (under FOOD), besides Determinants: Intake: Status: Health (DISH). KZ explained that the EC has asked for the whole food chain to be included, not just from the point of purchase, although how is still under discussion, as the area is as complex.

Thomas Arnold asked how consumers who produce their own food will be included. KZ agreed this and other issues (e.g. capturing information in megacities) are interesting but case studies are not currently available, and how these will be included needs to be explored further in parallel with, for example, buying local, animal welfare, etc.

Bent Egberg Mikkelsen explained that ESFRI is the European regulator for research infrastructures (RIs) and publishes their roadmap every two years, covering all domains. Based on this roadmap, Member States (MS) and Candidate Countries can decide whether to have a national roadmap that aligns with the ESFRI process. Here, the national facilities apply to join the roadmap.

Klazine van der Horst asked how FNH-RI and RICHFIELDS fit together. KZ explained her vision for FNH-RI is as the overarching structure connecting food-related resources, such as RICHFIELDS. Thus, interoperability, standardisation, etc. are very important to facilitate exploitation. She also highlighted the need for flexibility in the approaches for different Member States, and the expectation that every node will develop differently amongst different organisations.

14:30-15:00 Wider food, nutrition and health landscape (science vision and mission)

Marc-Jeroen Bogaardt, Wageningen Economic Research (NL)

See 2017-12-11 RICHFIELDS Phase 3 M-JB

Fred van Alphen asked what the minimum requirement for participation (donor). Marc-Jeroen Bogaardt described scenarios where an organisation/ resource would be eligible, but to date these criteria have not been defined and would need to be flexible and inclusive.

Bent Egberg Mikkelsen suggested that in parallel governance should have a broad scope involving a range of stakeholders (e.g. consumers and government need to be represented), and access to the FNH RI should be at the national level, in part to ensure appropriate support is available for users who may not speak English, for example.

Nadia Slimani-Popovic remarked that it is difficult to distinguish between FNH-RI and RICHFIELDS and understand how RICHFIELDS fits in the wider landscape. Equally, it must be recognised that many other platforms have already addressed ethical, legal and societal issues or are doing so though, for example, CORBEL (www.corbel-project.eu). Thus, it is essential to address relationships amongst these organisations, national nodes and RIs in practice.

Thomas Arnold asked about the scope of data and data sharing, which Marc-Jeroen Bogaardt explained could be a wide or narrow as necessary and is being addressed in the design.

Maartje van den Berg asked what the incentive are, for the likes of Nestlé, to be a provider (of data) or a user? KZ explained RICHFIELDS has case studies exploring these issues and has expended considerable effort to engage with big industry. The incentives remain an issue because sharing and cooperation at this level is a change in mind-set, but there is a willingness to start with behavioural and nutritional information.

Open (moderated) discussion (rapporteur: Siân Astley – EuroFIR AISBL BE) was postponed until Tuesday 12th December in favour of discussions with the breakout groups, because of the delays arising from travel and a power cut – again because of the weather – in the hotel.

15:30-17:30 Parallel working groups

The groups were adjusted from their original composition to ensure parity in numbers and skill-base, make allowance for those unable to attend or delayed.

Tuesday 12th December Parallel working groups & feedback

(rapporteur: Siân Astley – EuroFIR AISBL BE)

The agenda for day 2 was adjusted to give the groups extra time in breakout, following a shortened period during day 1 because of delays and power failure.

09:00-10:30 Parallel working groups

10:15-10:30 Break

- **10:15-10:45 Group 1: Using consumer-, research- & business-generated data: Information technology requirements** - Tome Eftimov (JSI, SI)

See 2017-12-12 Group 1 Technology Notes and 2017-12-12 Group 3 Business Notes.jpg

Briefly, the group talked primarily about user experience, specifically the interface and what and how users are likely to ask research questions and the options that should be available.

RICHFIELDS should have one template for data donation, but practical experience suggests it is unlikely that one template will fit all cases; there is also an issue with updating existing data.

Data formatting was discussed.

The approach taken was “I want as a user ...” because behind the scene technical issues (e.g. SQL versus an alternative) is largely irrelevant to the user.

Performance is a significant issue: users want searches to be rapid but, if data are globally sourced, searches could take considerable time to collect and analyse. For example, sales data can take 48 hours to collate, but these data are discrete and specific as well as from specific fully compatible sources. How long RICHFEILDS could take depends on how long users are prepared to wait; also, waiting is subjective, especially in the research world (e.g. writing a paper versus media enquiry). There needs to be a warning (e.g. returning data will take ...).

User identity, e.g. researcher versus journalist; users are likely to have very different needs and timescales. Some with want to be directed to data and, whilst the implementation is technical, the process needs to be supported where users are not data scientists. On the other hand, data scientist in comparison might want to write an SQL query.

Processing data costs energy; would a user want that energy expended on obtaining their energy (i.e. what are RICHFIELDS’s environmental ethics).

Never give without receiving; if an organisation can get information out it might be more willing to give information in the first place.

Marc-Jeroen Bogaardt: what did the discussions mean for RICHFIELDS in terms of staffing, governance, etc. Fred van Alphen said these are issues for RICHFIELDS to solve.

Karl Presser: existing RIs have a team of five for IT alone; Fred van Alphen suggested this is also a choice between good, cheap and quick ...

Paul Finglas: RICHFIELDS does not necessarily want to collect data; Fred van Alphen agreed but also made the point that collating from different sources will take time and use energy for processing.

Bent Egberg Mikkelsen: there would be some shorter responses; Fred van Alphen agreed, but there remains an issue with numbers of people using the system simultaneously.

Bent Egberg Mikkelsen: real-time calculations could be done; Fred van Alphen offered the example of Disney and other facilities that indicate levels of use at specific times.

Paul Finglas: “asking for the wrong thing” could be a problem for many users, which is where RICHFIELDS has the potential to add value, without doing the research per se.

Karin Zimmermann and Marc-Jeroen Bogaardt: discuss a scenario where data were stored? Group 1 did not explore this, but Tome Eftimov indicated this would impact functionality and some data might be stored on RICHFIELDS servers and should therefore be considered.

Karl Presser: RICHFIELDS must be clear where data are stored and accessed.

- **10:45-11:15 Group 2: Ethical, legal and societal issues: Framework for practice** - Javier de la Cueva (Consultant, ES)

See 2017-12-12 Group 2 ELSA notes (red text [notes])

People are collaborating and sharing (e.g. Wiki and Streetmaps); it was suggested these are not personal data; Javier de la Cueva stated this is true, but neither are recipes personal.

Marc-Jeroen Bogaardt: if we start with a selected group, these would be the first owners of the IP and ontologies; would these be owned by the Foundation? Javier de la Cueva replied that an ontology is a list of words and definitions and cannot be owned. The statutes of any Foundation, for example, with specify the rights of founding partners and subsequent members.

Karin Zimmermann: is it possible to make the various ethical, legal and societal issues and their implications more tangible with, for example, use cases, e.g. insurance company asks for data from RICHFIELDS, which may or may not benefit the consumer; Javier de la Cueva agreed this would be possible and forms part of the Phase 3 design. However, every dataset is different, and ‘normalisation’ will lead, ultimately, lead to examples that will cover all cases. RICHFIELDS is unlikely to differ in approach from Creative commons⁹ (seven basic licenses); we can anticipate⁹ some, but others will develop organically, e.g. an organisation might initially require a bespoke policy that can, subsequently, be adapted for use with others.

⁹ Creative Commons is an American non-profit organization devoted to expanding the range of creative works available for others to build upon legally and to share - <https://creativecommons.org>

Karin Zimmermann: what about where it is not clear already? Javier de la Cueva suggested there are two approaches 1. As above – create a bespoke solution or 2. Respond case-by-case, but avoid spending money on lawyers to create these terms and conditions.

- **11:15-11:45 Group 3: Using consumer-, research- & business-generated data for research: Envisaging the future – innovation, citizen science and other breakthroughs** - Bent Egberg Mikkelsen (AAU, DK)

See 2017-12-12 Group 3 Citizens 1 and 2 Notes.jpg

Briefly, Group 3 discussed how RICHFIELDS could move closer to citizens and develop citizen science to generate data; Bent Egberg Mikkelsen described some examples from DK, creating awareness of scientific questions, etc.

For the purposes of discussion, Group 3 envisaged two scenarios: (1) school canteen manager and (2) elderly individual. The aim of the former was to provide menus for schools that would make the choices available healthier; the former aims to maintain quality-of-life and independent living. Thus, they might use RICHFIELDS to see if data are available on health menus, if there are similar studies, where such data could be found, whether a study is needed and if so how, what national dietary reference values are for these populations, what current eating habits are, others engaging in similar activities (e.g. public health campaign), whether they can access and assess intakes and or share the data for others to use.

Karin Zimmermann: how does this add to citizen science? It was agreed that the examples were more applicable to non-researcher users of RICHFIELDS.

Thomas Arnold: where are the sources? There is a lot of discussion about data, but much less about how you source these resources and variability in potential data sources.

Karin Zimmermann: we need to be more specific about what a RI is and what is citizen science.

Bent Egberg Mikkelsen: it is important that citizens with interest in science donate something.

It was stated that the public needs to understand what science can do and how they contribute to this process, but (Karin Zimmermann) it is not clear whose role this is, e.g. RI or the JPI.

Thomas Arnold: another challenge is citizen science versus citizen users (of data), i.e. how does RICHFIELDS help me (e.g. get my BMI back within the normal range); public understanding of science might be improved through engagement in citizen science but, equally, citizen science requires some public understanding in terms of engagement.

Karin Zimmermann: RI is a facilitator not a research organisation.

- **11:45-12:15 Group 4: Business model of RICHFIELDS: value propositions, key suppliers and key activities** - Golboo PourAbdollahain (CNR, IT)

See 2017-12-12 Group 4 Business Notes

What came out of Group 4 discussions was the concept of RICHFIELDS is still very complicated and the vision is for the mature RI; the launch will need to smaller scale and simpler.

Karin Zimmermann: no one business model fits all requirements and RICHFIELDS will need to respond to organisational needs.

12:15-13:15 Feedback from delegates: Open discussion (moderated – Paul Finglas)

“Where do you and your organisation fit in the wider FHN-RI?”

Nadia Slimani-Popovic: there need to be better definitions regarding the over-arching RI and RICHFIELDS as a platform for consumer- and research-generated data.

Thomas Arnold: are we talking about a platform for consumers or consumer- and research-generated data? Paul Finglas: probably, this still has to be agreed.

Giulia Vilone: primary interest for our company in RICHFIELDS is data, particularly food consumption, more specifically RICHFIELDS might offer access to new large data sources that currently cannot be accessed, which can be used to build consumption models.

Paul Finglas: what might you give back to the platform?

Giulia Vilone: likely we would have tools/ models that support better understanding of the data including feedback from users of the data/ tool, benefiting diet and health researchers.

Paolo Colombani: (primary interest) determinants for why consumers would buy our product or competing products. Paul Finglas: is this not market research that you could fund yourself? Paolo Colombani: would be looking for scientifically validated and assessed data.

Maria Glibetic: inherent weakness in some consumer data that does not allow business decisions; Paolo Colombani agreed but RICHFIELDS would offer ease of access, breadth of information.

Paul Finglas: what would you offer back?

Paolo Colombani: participant in a community of users; data that might be shared or cohort(s) that might be otherwise exploited by RICHFIELDS; data collected with standardised approaches.

Thomas Arnold: for public policy, knowledge is an issue, specifically evidence-based policy making, which is becoming more important at all levels. Clearly defined goals (e.g. climate) exist but getting scientifically validated information demonstrating the impact of policies is very difficult and RICHFIELDS could bring these agendas forward; whether using the data from the platform or using data to develop research to achieve these ends. Policy-relevant knowledge and future proofing food and nutrition

systems are needed to reduce the distance between status quo and goals, e.g. protein alternatives to reduce water and land consumption, and feed a larger global population equably.

Paul Finglas: business model for RICHFIELDS could be based on promoting innovation?

Thomas Arnold: yes, but also helping citizens access personalised information and support to achieve specific global or personal goals.

Nadia Slimani-Popovic: relevance of the platform is not in doubt and the experience of other RIs means there is a need for an equivalent around food, but I need to understand more about the over-arching entity and the role and purpose of RICHFIELDS within that as well as how RICHFIELDS will behave as a facilitator and a data provider. Also, ESFRI and others need to have a political mandate to function as wider FNH-RI.

Paul Finglas: how would you use RICHFIELDS?

Nadia Slimani-Popovic: a lot of new and innovative work could be done in cooperation with consumers, as users including data providers; need to know what data are available, how it is structured, conflicts of interest, particular in regard to public and private cooperation.

Luca Bucchini: difficult to answer because it is still unclear what types of data and services might be available; minimum expectation would be access to data that are not currently available. Experience with data from open systems is not satisfactory; data are not formulated appropriately, described correctly or supported by metadata. Other commercial organisations are collecting consumer data, which create moral dilemmas, and RICHFIELDS might be a solution, but the food industry need to be engaged. RICHFIELDS might stimulate cooperation amongst commercial interests, making the data more readily publically available, where currently transparency is lacking.

Maria Kapsokefalou: would like to rephrase the question to where might UAU contribute; UAU has detailed information on primary food production, for example. Personally, I would like to highlight an aspect of users that has not been discussed, specifically supporting and or obtaining data for vulnerable groups in society for users to explore and deliver better services.

Paul Finglas: research or training and education, nationally or internationally?

Maria Kapsokefalou: both and internationally

Birdem Amoutzopoulos: Our expertise is in national diet and nutrition survey and we use food comp databases. What we find challenging is the changing food market and keeping up-to-date with changing eating habits and reformulation of products (e.g. increased tax on soft drinks saw reduction in consumption of such products). RICHFIELDS would be helpful through establishing links with food industry, leading to access of – for example – information about their products; this would benefit manufacturers and retailers by facilitating access without the need for direct exchange as well as access to competitors' information.

Paul Finglas: this information is available in the UK through Brandbank, although there are limitations (e.g. uses) and costs

Birdem Amoutzopoulos: Yes, and we use this. We also use Cantor. However, they are not complete and Public Health England has to engage with individual manufacturers and retailers.

Paul Finglas: How about in Scandinavia?

Bent Egberg Mikkelsen: On the whole manufacturers have been helpful, providing nutritional content, for example.

Maria Glebetic: Understanding changes in behaviour would enable the types of data needed

Paul Finglas: Reformulation is difficult, e.g. sugar – related to policy, protein and consumer want

Maartje van den Berg: Still struggle to understand what RICHFIELDS is because it appears to be aims to be many things, perhaps too many. Collaboration whilst noble does not take into account the competition and value of data, reflecting the consumer versus citizen, i.e. we are all in favour of being healthy but, in practice, we our behaviours do not reflect this. RICHFIELDS needs to start with what primary users – researchers – need and what is possible (e.g. expand the case studies). Designing the platform and keeping business users in mind distracts from the need to demonstrate feasibility; data are very valuable, understanding the data is important and having addressed the ethical, legal and societal issues is very important as a starting point. Consider that global sugar market is increasing 2% annually, but consumption of sugar (as a product) is decreasing, so where is the sugar going? It is moving into new products, e.g. sports drinks, high sugar coffee products. Global markets want to know where foods/ food elements are and where they are moving to within the market, and RICHFIELDS might have a role in this, but this is difficult to achieve and deliver consistently.

Klazine van der Horst: Really feel that while RICHFIELDS cannot define its purpose, I could not sign up. As a user, I do not know what you are providing since, for example, in the two case studies described there are better, more obvious routes for information (e.g. school canteen – contact a dietitian; elderly – Google for available information). I might use RICHFIELDS for the same reason as policymakers (e.g. what size is a typical portion as consumed typically rather than defined by government or food manufacturers); this is the kind of information that researchers would be interested in obtaining. RICHFIELDS could also added value by bring together different resources, which individuals and even organisations struggle to achieve.

Paul Finglas: this is a much narrow focus than envisaged

Klazine van der Horst: Perhaps but, if the core of RICHFIELDS is – for example – personalised nutrition then the industry would view RICHFIELDS as a route into the consumer, i.e. how do I get my product recommended.

Aida Turrini: Providing and getting information from production to consumption; what we would get from RICHFIELDS would be the most up-to-date validated information across wider population(s). RICHFIELDS should be a source of information that can be combined across sources as necessary; for example, an option to combine information about nutrients and contaminants, which is very complex to achieve manually, even with a small dataset. Clarification of information and the correct understanding/ interpretation (e.g. 0.9 is 1 not 0), for example, policymakers would be useful. In exchange, organisations, such as CREA, could provide their data (e.g. processing to consumption) and tools (e.g. modelling environmental impact).

Karl Presser: As a developer, RICHFIELDS needs focus on its core business (delivery of data and knowledge) and outsource other demands (e.g. research). However, it is still not clear what data/resources are included in the platform or what is in the FNH-RI.

Paul Finglas: what about as an SME or METROFOOD?

Karl Presser: these are completely different and have different needs. RICHFIELDS need a better business plan for the various stakeholders.

Aida Turrini: if RICHFIELDS could identify a sustainable healthy diet then industry could produce it and consumers eat it ...

Maria Glibetic: completely agree with everything that has been said as a researcher and a SME that works in a specific region of Europe with very specific societal issues. We lack efficient knowledge transfer, but there is a hunger for information and the ability to apply it. Thus, individuals and organisations need to know what information is available for them to exploit, ensuring competitiveness within the EU market. Researchers will use the information and will always have an appetite for data but, before this can happen in the Balkans market, training to use RICHFIELDS and interpret outputs will be needed for it to be recognised as a valuable resource. After two meetings, I am beginning to understand the aims and goals, but the concept is very challenging to deliver and be attractive; cost will also be an issue.

Paul Finglas described data that is currently available and might be put in a start-up platform

Thomas Arnold: would this be for 450 M Europeans?

Paul Finglas: Ideally, yes

Thomas Arnold: it would be very messy

Siân Astley, Eftimov and Nadia Slimani-Popovic: it doesn't have to be

Karl Presser: this is the same as FNH-RI

Paul Finglas: yes, because RICHFIELDS is part of the FNH-RI

Nadia Slimani-Popovic: what is lacking is the sources of these data

Paul Finglas: we do have that too

Maria Glibetic: some will be in the research, but some will come from other external (perhaps messy) sources, e.g. health, industry, grey literature

Karl Presser: consumer generated data, what and which, and this needs to be included in the design

Maria Glibetic: consumer generated data would be the searches for recipes, whilst the research data might be consumption or GS1 data, all of which can be mapped on to each other.

13:15 Lunch and close

A5.2 Pre- and post-event questions and responses

A5.2.1 Pre-event questions and responses

	Are you from a RICHFIELDS partner organisation ¹⁰ ?	Have you attended a previous RICHFIELDS's platform or workshop ¹¹ ?	It is 2025 ... why is a consumer data platform important to you?
1	No	No	to leapfrog globally towards sustainable and healthy diets beyond hunger and obesity
2	No	No	To answer research questions
3	No	Yes	We want to enable consumers to make better informed food choices by connecting the food business operators to consumers, consumers to nutrition practitioners, and (their data) to researchers. This vision has many similarities with RICHFIELDS, so we would like to be part of this and contribute.
4	No	No	To enable both my bank and its clients (companies in the food &agri space) to judge risks and opportunities
5	No	Yes	To have a better understanding of consumer demand in terms of improving public health.
6	No	Yes	There is a need to provide a comprehensive and reference platform for consumers, enabling access and dissemination on dietary information designed and targeted to their specific needs and interests.
7	No	No	To provide a source for all, with one version of the truth
8	No	Yes	It is important to enable better business decisions that address the real needs of society from a public health perspective.
9	No	Yes	Because it is the fundamental base for the development of personalized/precise recommendations within the area of health protection/maintenance and treatment of noncommunicable diseases.
10	No	Yes	Exposure analysis from diet
11	Yes	Yes	To optimise the way in which I do my research utilising digital data sources
12	Yes	Yes	to manage healthy eating and to use for research
13	Yes	Yes	It will enable the doing of research and policy monitoring in the area of food, diet and health
14	Yes	No	To have access to data for research in order to evaluate new methods
15	Yes	Yes	To provide me high quality data, a complete directory of data sets and individual consumers data
16	Yes	Yes	I don't know.
17	Yes	Yes	Sometime they told us tobacco was good for our lungs. Sometime mad cows happened. Let us not allow these things happen again.
18	Yes	Yes	Access to data at a single point of entry with technical support
19	Yes	No	To have access to data that would not be available for me in any other way.

¹⁰ i.e. LEI, DIL, EuroFIR, JSI, WU, USurrey, SP, AAU, De la Cueva, ETHZ, QIB, CNR, AALTO

¹¹ RICHFIELDS Stakeholders' Platform (June 2016, Brussels BE)

RICHFIELDS Stakeholders' Workshop 1 (September 2016, Schiphol NL)

RICHFIELDS Stakeholders' Workshop 2 (April 2017, Brussels BE)

A5.2.2 Post-event questions and responses

	Are you from a RICHFIELDS partner organisation ¹² ?	Have you attended a previous RICHFIELDS's platform or workshop ¹³ ?	It is 2025 ... why is a consumer data platform important to you?
1	No	Yes	A platform would give me some conscious about behaviour and provide me some data about consumption. This could influence my choices and behaviour, but it must be connected to nutrients and health.
2	No	No	To enable access across parties and to be able to link various data sources.
3	No	Yes	It is crucial to plan nutritional policy in an effective way
4	No	Yes	Better science. Better use of resources. New insights. More efficient networks
5	No	No	2025. Time for reality check for where we stand with SDG goals and targets and objectives of Paris agreement related to food and nutrition systems. Food waste curbed? Progression of obesity halted or reversed? Sustainable and healthy diets now the default? GHG emissions from food system addressed, etc. Dozens of questions. Then, how to proceed further? How to get policy-relevant knowledge for required adaptations of policy?
6	No	No	2025. Time for reality checks where we stand with regard to the SDGs and Paris Climate Agreement, related to food and nutrition systems. Did Europe advance towards sustainable and healthy diets? Has the carbon food print of the food system been properly addressed? Has the progression of obesity been halted or reverted? Did the choice architecture for consumers change? Have foods been reformulated? What is the place of alternative proteins? What alternatives are there now available for food packaging to avoid marine pollution? Is there progress of reducing food waste? Dozens of questions for the reality check. How then to go on with which policies? How can these policies be made more evidence-based? How can policies be better targeted to specific groups and places?
7	No	Yes	It has the potential to inform and improve decision making regarding public health
8	No	No	To enable Rabobank and its corporate clients to improve judgement on risks and opportunities in the food & agri sectors. Additionally, nutrition is an important strategic theme for the bank, on which - as an internal research unit - we need to be able to opine both internally and externally.
9	No	Yes	it will improve the provision of more tailored made/personalised information/products to our customers
10	No	No	Decision making
11	No	Yes	I am getting access to a comprehensive and extensive database on food consumption in Europe that allows me to run more refined analyses on diet related issues, such as exposure to food hazards and nutritional gaps
12	No	No	Because it offers consolidation of valid, enriched and good quality data that can be easily constructed to my needs in selection and aggregate level.
13	No	No	The Richfields platform has created an open big data ecosystem, which allows European industry to compete with the closed ecosystems of Alibaba, Google and Facebook. Start-ups (SMEs) have developed IA-based tools and provides on demand analysis to exploit the data. As a consulting company, we use such tools, and develop our own analyses to provide information to regulators and our customers.
14	Yes	Yes	To facilitate better consumer-oriented research in Europe, by linking new and relevant datasets en use valid ad tools to collect data in standardised and harmonised way. This enable me to do more efficient and effective research and share valuable outcomes via the platform with the FNH community
15	Yes	Yes	Because it provides access to the information about food and health, and nutritional patterns and trends, which is useful for researchers to find links between nutrition and health.
16	Yes	Yes	Quality of the data
17	Yes	Yes	The increased use of technology means there is a wealth of data that could be used for research but access to it needs to be facilitated by a data platform/RI that addresses the Legal, Ethical and Societal issues associated with research utilising this data.
18	Yes	Yes	So more data is known and available for doing research to find new insights to better fight the problems of food insecurity and health
19	Yes	No	To compare results of new methods on data which is used for previous scientific studies.

¹² i.e. LEI, DIL, EuroFIR, JSI, WU, USurrey, SP, AAU, De la Cueva, ETHZ, QIB, CNR, AALTO

¹³ RICHFIELDS Stakeholders' Platform (June 2016, Brussels BE)

RICHFIELDS Stakeholders' Workshop 1 (September 2016, Schiphol NL)

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Annex 6: Feedback from participants

No responses were received.

