Integrating perspectives on consumer perceptions for food safety, nutrition and waste – the role of capability and opportunity

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Dietary guidance

Are food safety, nutrition and waste combined?
Scientific Advisory Bodies

Differing statutory and legal roles across Europe

- Nutrient recommendations typically developed by *Scientific Advisory Bodies*
- Groups through which expert advice enters the political process and can be established institutions, short term commissions, ad hoc and standing committees and informal network of experts
- "Boundary organisation" that feeds technical recommendations into policy development process
- Crucial in the development of public health nutrition policy
- WHO (2008): link between the existence of *Scientific Advisory Bodies* for nutrition and nutrition policy implementation
Public Health Nutrition Framework

Science (Social & Natural)
- e.g. systematic reviews, behaviour science, nutrient intake data, attitudes

Wider Context
- e.g. systematic reviews, behaviour science, nutrient intake data, attitudes

Policy & Institutions
- e.g. governance networks & regulatory frameworks, data on existing policy, policy change theories

Health Outcome

Policy Action

Most common messages in national dietary guidelines by income level


E.g. reference to prevalence foodborne diseases or simply the way government departments are organised.
<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Brazil</th>
<th>Sweden</th>
<th>Qatar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fruit and Vegetables</strong></td>
<td>Choose mainly plant-based foods.</td>
<td>Eat foods mainly of plant origin.</td>
<td>Eat lots of fruit and vegetables (at least 500g per day)</td>
<td>Eat vegetables with most meals, including snacks.</td>
</tr>
<tr>
<td></td>
<td>Enjoy 5 portions of fruit and vegetables daily.</td>
<td>Chose seasonal and locally grown produce.</td>
<td>Choose high fibre vegetables.</td>
<td>Aim for 3-5 servings of vegetables and 2-4 of fruits every day.</td>
</tr>
<tr>
<td><strong>Meat</strong></td>
<td>Eat meat in moderation.</td>
<td>Try to restrict the amount of red meat.</td>
<td>Eat less red and processed meat (no more than 500 grams of cooked meat a week). Only a small amount of this should be processed.</td>
<td>Choose lean cuts of meat. Limit red meat (500g per week) Avoid processed meats.</td>
</tr>
<tr>
<td></td>
<td>White meat is healthier than red meat.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Processed food</strong></td>
<td>Limit the consumption of processed foods and avoid ultra-processed foods.</td>
<td></td>
<td></td>
<td>Eat less fast foods and processed foods.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Germany</th>
<th>Brazil</th>
<th>Sweden</th>
<th>Qatar</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dairy</strong></td>
<td>Consume milk and dairy products daily.</td>
<td>Milk drinks and yogurts that have been sweetened, coloured and flavoured are ultra-processed foods, and as such should be avoided.</td>
<td>Choose low-fat, unsweetened products enriched with vitamin D.</td>
<td>Consume milk and dairy products daily.</td>
</tr>
<tr>
<td></td>
<td>Choose low fat.</td>
<td></td>
<td></td>
<td>Choose low fat. If you do not drink milk or eat dairy products, choose other calcium and vitamin D rich foods (e.g. fortified soy drinks, almonds, chickpeas).</td>
</tr>
<tr>
<td><strong>Fat and oil</strong></td>
<td>Fat and fatty foods in moderation.</td>
<td>In moderation.</td>
<td>Choose healthy oils when cooking, such as rapeseed oil or liquid fats made from rapeseed oil, and healthy sandwich spreads.</td>
<td>Avoid saturated fat and hydrogenated or trans fat.</td>
</tr>
<tr>
<td></td>
<td>Choose fats and oils from vegetable origins.</td>
<td></td>
<td></td>
<td>Use healthy vegetable oils such as olive, corn and sunflower in moderation.</td>
</tr>
<tr>
<td>Main messages in national dietary guidelines that include sustainability</td>
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<tr>
<td>---------------------------------------------------------------</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fish</strong></td>
<td><strong>Behavioural advice</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>--------------------</td>
<td>-------------------------------------------------------------</td>
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</tr>
<tr>
<td>Germany</td>
<td>Brazil</td>
<td>Sweden</td>
<td>Qatar</td>
<td></td>
</tr>
<tr>
<td>Once to twice a week</td>
<td></td>
<td>Eat fish and shellfish two to three times a week.</td>
<td>At least twice a week.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vary your intake of fatty and low-fat varieties and choose eco-labelled seafood.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Preferably cook foods on low heat, for a short time, using little amount of water and fat.</td>
<td>Eat regularly and carefully in appropriate environments and, whenever possible, in company.</td>
<td>Try to maintain energy balance by eating just the right amount.</td>
<td>Build and model healthy patterns for your family:</td>
<td></td>
</tr>
<tr>
<td>Use fresh ingredients whenever possible (this helps to reduce unnecessary packaging waste).</td>
<td>Develop, exercise and share cooking skills.</td>
<td></td>
<td>• Keep regular hours for meals.</td>
<td></td>
</tr>
<tr>
<td>Take your time and enjoy eating.</td>
<td>Plan your time to make food and eating important in your life.</td>
<td></td>
<td>• Eat at least one meal together daily with family.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Be wary of food advertising and marketing.</td>
<td></td>
<td>• Be a role model for your children when it comes to healthy eating and physical activity</td>
<td></td>
</tr>
</tbody>
</table>
The Eatwell Guide is a visual representation of a balanced diet. It is designed to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.

- **Fruit and vegetables**: Eat at least 5 portions of a variety of fruit and vegetables every day. Choose wholegrain or higher fibre versions with less added fat, salt and sugar.
- **Beans, pulses, fish, eggs, meat and other proteins**: Eat more beans and pulses, 2 portions of sustainably sourced fish per week, one of which is oily. Eat less red and processed meat.
- **Dairy and alternatives**: Choose lower fat and lower sugar options.
- **Oils and spreads**: Choose unsaturated oils and use in small amounts.
- **Potatoes, bread, rice, pasta and other starchy carbohydrates**: Choose whole grain cereal, porridge, whole wheat pasta, bagels and rice.

Additional tips:
- **Water, lower fat milk**: Aim for 6-8 glasses a day.
- **Sugar-free drinks**: Include tea and coffee.
- **Smoothies**: Limit fruit juice and smoothies to a total of 150ml a day.

Source: Public Health England in association with the Welsh government, Food Standards Scotland and the Food Standards Agency in Northern Ireland.
Food and cooking skills – scope for change?

• Healthful shopping
• Sustainable eating behaviour
• What are cooking and food skills?
• Content of successful cooking skills and dietary behaviour change and interventions contain
• Cooking and food skills
  o Barriers and facilitators to cooking from ‘scratch’ using basic or raw ingredients
  o Learning cooking skills at different ages
Aim: to explore consumers’ perceptions of a healthful shop and identify barriers to conducting a healthful shop

Northern Ireland and Republic of Ireland

Data collection method: n=50
Accompanied regular shop
Healthful shopping

How health is represented in consumers’ food purchasing decisions

- **A healthy shop requires effort**
  - What’s right versus what’s easier or more desirable
  - Limited time and/or money
  - Convenience

- **Using product-based inferences as a guide**
  - Labelling
  - Branding
  - Perceived health benefits

- **Being responsible for meeting the needs of others**
  - Parental responsibility
  - Health needs of others
  - Needing to treat

- **Controlling the self**
  - Lack of self control
  - Complete avoidance of food products or categories
  - ‘All or nothing’ approach

Barriers to conducting a healthful shop

- Barriers to healthful shopping:
  - Lack of self-efficacy in choosing, preparing and cooking healthful foods
  - Ability to manage time
  - Ability to manage money
  - Ability to prepare and cook healthful foods
  - Ability to choose healthful foods
  - Conflicting needs when satisfying self and others

- Whilst the importance of healthy eating was recognised, consumers were unaware how internal and external cues impacted on carrying out a healthful shop
## Characterizing product decisions (%)

<table>
<thead>
<tr>
<th>Type of decision</th>
<th>Accompanied shop n=2424</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>35.5</td>
</tr>
<tr>
<td>Preference</td>
<td>29.5</td>
</tr>
<tr>
<td>Appearance</td>
<td>22.8</td>
</tr>
<tr>
<td>Placement</td>
<td>20.0</td>
</tr>
<tr>
<td>Who eats</td>
<td>19.0</td>
</tr>
<tr>
<td>Familiarity</td>
<td>19.7</td>
</tr>
<tr>
<td>Availability</td>
<td>8.9</td>
</tr>
<tr>
<td>Packaging preference</td>
<td>8.2</td>
</tr>
<tr>
<td>Plans and inspiration</td>
<td>9.3</td>
</tr>
<tr>
<td>Reference to pantry</td>
<td>11.2</td>
</tr>
<tr>
<td>Quality</td>
<td>8.3</td>
</tr>
<tr>
<td>Health</td>
<td>6.6</td>
</tr>
<tr>
<td>Convenience</td>
<td>5.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of decision</th>
<th>Accompanied shop n=2424</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscious decision-making</td>
<td>4.8</td>
</tr>
<tr>
<td>Nutrients</td>
<td>4.3</td>
</tr>
<tr>
<td>Shopping experience</td>
<td>4.2</td>
</tr>
<tr>
<td>How it will be used</td>
<td>3.0</td>
</tr>
<tr>
<td>Unavailability</td>
<td>3.3</td>
</tr>
<tr>
<td>Boring/interesting</td>
<td>3.1</td>
</tr>
<tr>
<td>Cooking time</td>
<td>1.6</td>
</tr>
<tr>
<td>Speciality e.g. artisan</td>
<td>2.6</td>
</tr>
<tr>
<td>Ingredients</td>
<td>2.7</td>
</tr>
<tr>
<td>Stated barriers</td>
<td>2.4</td>
</tr>
<tr>
<td>Treat - people</td>
<td>1.4</td>
</tr>
<tr>
<td>Cooking method</td>
<td>1.5</td>
</tr>
</tbody>
</table>
## Sustainable eating behaviour scales

<table>
<thead>
<tr>
<th>Name of the Scale</th>
<th>Source</th>
<th>Items</th>
</tr>
</thead>
</table>
| Index of sustainability of food practices              | Tobler et al (2011) Appetite                | Buy regional (local) food  
Avoid products with excessive packaging  
Buy organic food  
Eat only seasonal fruit and vegetables  
Eat meat at most twice a week or little at a time  
Avoid food products that were imported by airplane |
Buying organic fruits and vegetables  
Buying organic dairy  
Buying free range meat  
Buying products with a sustainability label  
Eating smaller portions of meat  
Eating less  
Eating less dairy  
Eating smaller portions of meat  
One meat free day a week |
Shopping at farmers’ markets  
Choosing organic or fair-trade foods and beverages  
Selecting meats that are raised without antibiotics or hormones  
Frequency of purchasing meat or poultry labelled ‘free range’ |
| Green Eating behaviour scale (original)                | Weller et al. (2014) Journal of Nutrition Education and Behavior  | Locally grown foods are grown within 100 miles from your location. Based on this, how often do you eat locally grown foods?  
When is season, how often do you shop at farmer’s markets?  
How often do you choose foods that are labelled USDA organic?  
How often do you select meats, poultry and dairy products that are raised without antibiotics or hormones?  
How often do you select food or beverages that are labelled fair-trade certified?  
How often do you buy meat or poultry labelled ‘free range’ or cage free? |
Studies

1) Qualitative longitudinal research to explore openness to adopting sustainable healthy eating behaviour

2) Qualitative research with the objective to develop a sustainable healthy eating behaviour index

3) Randomised controlled trial to describe consumers’ reactions on interactive tailored messages about sustainable healthy eating

Sustainable healthy eating index (29 items)

- Healthy and balanced diet
- Use of quality labels (regional and organic)
- Meat reduction
- Selection of local food
- Choice of low fat food products
- Avoidance of food waste
- Purchase and consumption of food products that respect animal welfare
- Seasonal food
### Common components relating to the measurement of cooking skills and food skills

<table>
<thead>
<tr>
<th>Component</th>
<th>Cooking Skills</th>
<th>Food Skills</th>
<th>External</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food preparation and cooking frequency (type of cooking, peeling veg etc.)</td>
<td>13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General cooking confidence/cooking ability</td>
<td>12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meal patterns (frequency of breakfast, lunch, dinner, eating out etc.)</td>
<td>11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooking attitudes/enjoyment of cooking</td>
<td>9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planning food shopping/writing lists</td>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health consciousness relating to choosing foods and feeding others</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Typical food selection (e.g. pasta, rice, chips, fruit and vegetables etc.)</td>
<td>7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Purchasing and shopping behaviours (frequency of reading food labels etc.)</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence/ability to cook specific meals</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence/ability with specific cooking techniques (knife skills, baking, frying, etc.)</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Menu planning behaviours (frequency of planning menus/meals)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food safety and hygiene practices/behaviours (frequency of hand-washing, thawing food correctly etc.)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\(n=\) frequency measured in 26 studies

<table>
<thead>
<tr>
<th>Component</th>
<th>Cooking Skills</th>
<th>Food Skills</th>
<th>External</th>
<th>n=frequency measured in 26 studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confidence/self-efficacy in choosing and preparing healthy and nutritious foods (e.g. fruit and vegetables)</td>
<td></td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Confidence/ability to cook specific foods (e.g. chicken, meat, vegetables, etc.)</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Budgeting for food, comparing prices and using coupons etc.</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Barriers to cooking and food choices (e.g. time, equipment, resources)</td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Cooking practices (type of cooking oil, adding salt etc.)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Confidence following a recipe</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Food preparation complexity (types of ingredients, number of ingredients in a recipe, etc.)</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Source of learning to cook</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Frequency of recipe use</td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Food management (ensuring food lasts for week/month etc.)</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Responsibility for cooking and shopping</td>
<td></td>
<td></td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Advance planning and food preparation behaviours (specifically pre- part-preparing/cooking meals)</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Behaviour change interventions
COM-B Behavioural system

- physical
- psychological (the capacity to engage in the necessary thought processes - comprehension, reasoning)
- reflective processes (involving evaluations and plans)
- automatic processes (involving emotions and impulses that arise from associative learning and/or innate dispositions)
- physical (afforded by the environment)
- social (afforded by the cultural milieu that dictates the way that we think about things (e.g., the words and concepts that make up our language)

Successful cooking skills and dietary behaviour change interventions contain:

**Training**
- Prompt practice

**Education**
- Increasing knowledge or understanding
  - Information on the consequences of the behaviour in general
  - Instruction on how to perform the behaviour
  - Information on the consequences of the behaviour tailored to the individual
  - Set graded tasks

**Physical**

**Psychological**
- The capacity to engage in the necessary thought processes - comprehension, reasoning

**Reflective processes**
- Involving evaluations and plans

**Automatic processes**
- Involving emotions and impulses that arise from associative learning and/or innate dispositions

**Physical**
- Afforded by the environment

**Social**
- Afforded by the cultural milieu that dictates the way that we think about things (e.g., the words and concepts that make up our language)
Successful cooking skills and dietary behaviour change interventions contain

Enablement
Increasing means/reducing barriers to increase capability or opportunity
- **Barrier identification**
- **Information on when and where to perform the behaviour**

- **Physical**
- **Psychological**
  *the capacity to engage in the necessary thought processes - comprehension, reasoning*

- **Reflective processes**
  *involving evaluations and plans*

- **Automatic processes**
  *involving emotions and impulses that arise from associative learning and/or innate dispositions*

- **Physical**
  *afforded by the environment*

- **Social**
  *afforded by the cultural milieu that dictates the way that we think about things (e.g., the words and concepts that make up our language)*
Barriers and facilitators to cooking from ‘scratch’ using basic or raw ingredients

A qualitative interview study

27 semi-structured interviews were conducted with participants (aged 18-58 years) living on the Island of Ireland (NI and ROI)
### Perceptions of ‘cooking from scratch’

<table>
<thead>
<tr>
<th>Perceived ability</th>
<th>Personal definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 = very poor</td>
<td>“If you were making your own sauces, all like fresh food, using actual spices, I would consider made from scratch meals obviously the healthiest.”</td>
</tr>
<tr>
<td>3</td>
<td>“I suppose in the traditional meaning it is totally everything, practically growing your own, but I think times have moved on. I think cooking from scratch is...it's actually washing the vegetables, getting the earth off them and peeling them and cutting them yourself, it's more vegetables, maybe with chicken, I do buy whole chickens but chicken fillets are easier, I tend to go for ones that are marinated so that's really convenience too, I wouldn't be marinating.”</td>
</tr>
<tr>
<td>5</td>
<td>“Cooking from scratch means opening the jar and putting it into the saucepan, adding my own blend of herbs and spices to it, making the meatballs, I make the meatballs from scratch and then putting the pasta on.”</td>
</tr>
<tr>
<td>7 = very good</td>
<td>“Anything that can easily be made from the raw ingredients, I'd still assume like vegetable stock or chicken stock or pasta to be from scratch even though in the past I have made these from flour and wheat and that but I'd still kind of dub these essentials as allowing to be from scratch. For example bolognaise ... I could just buy a jar of Dolmio and that would be seen as cooking a meal but in my eyes it's not from scratch. From scratch is the main portion of the meal should come from raw ingredients with the minimum amount of pre-made ingredient, for example pasta takes quite a while to make from fresh so I use just a bag of that.”</td>
</tr>
</tbody>
</table>

Facilitators and barriers to cooking from ‘scratch’ using basic or raw ingredients

Facilitators:
- Desire to eat for health and well-being
- Creative inspiration
- Ability to plan and prepare meals ahead of time
- Greater self-efficacy in one's cooking ability

Barriers:
- Time pressures
- Desire to save money
- Desire for effortless meals
- Family food preferences
- Effect of Kitchen Disasters

Future interventions should focus on:
- practical sessions to increase self-efficacy in cooking skills
- highlight the importance of planning ahead
- teach methods such as batch cooking with basic ingredients and freezing

Learning cooking skills at different ages

A cross-sectional study

Survey of a nationally representative sample of 1049 adults aged 20–60 years from the Island of Ireland (NI and ROI)
Sources of cooking skills

The top five stated sources from where cooking skills were learnt:

- Mother (60.1 %)
- A different relative (16.2 %)
- Friends (13.6 %)
- Secondary School (9.3 %)
- Food Packet (7.1 %)

People stating mother as only source of cooking skills had significantly better outcomes on:

- Cooking confidence
- Number of cooking skills
- Cooking Creativity
- Cooking Identity
- Eating Choice Index (discriminates healthy and unhealthy eating behaviours)
- Consumption of fried food
- Consumption of takeaway
- Consumption of takeaway style food from shops
- Portions of fruit per day
- Portions of veg per day

Positive associations of learning cooking skills as a child or teenager

Compared to adult-learners, child- and teen-learners reported higher levels of:
- cooking creativity
- cooking identity

Compared to adult-learners, child-learners:
- spent more time in food preparation (both weekday and weekend)
- reported less food waste
- consumed less takeaways
- consumed less takeaway convenience food from the supermarket and shops
- ate more fruit

Compared to adult- and teen-learners, child-learners had significantly better scores in:
- food management
- food waste reduction

Compared to adult-learners, teen-learners had:
- greater cooking confidence
- greater food skills confidence
- used more food skills
- were more open to new food
- had a higher Food Safety knowledge
- consumed less fried food, biscuits, chocolate or savoury foods

Differences in the type of ingredients used

Food space – impact on food safety, nutrition and waste

Example of urban rental accommodation
Urban living – what are home food spaces?

- Work frequently demands greater mobility and nomadism, thus influencing people’s lifestyles and consumption models.
- Increasing numbers of people work far from “home”, using small residential units for (parts of) the working week and returning “home” at (some) weekends.

**Personal space**

- 6 bedroom, all with en-suite, shared house with shared facilities
- kitchen facilities are shared as is the communal area and garden
- fully fitted shared kitchen with appliances
- communal dining area & communal garden
- £750 per calendar month

**Shared space**
Urban living –
Expectations of food-related resources?

What food-related resources can a tenant expect to have?

What are a landlord’s responsibilities with regard to providing food-related resources?

- **Cooking facilities?**
- **Storage facilities?**
- **Waste facilities?**

- A conveniently located bedsit with cooking facilities in the room and use of a shared bathroom.
- No parking but only a 5 minute walk to Town Centre.
- £425pm Including All Bills. Deposit £637.50 Agency fee: £100 per applicant.
- Full references required, a guarantor may be required and is subject to referencing and agency fee.
Consequences of transient populations?

The recycling rate for 2015/16 was 33 per cent. It needs to be at 50 per cent by 2020 or the council will be hit with “hefty fines.”

Everything you need to know about bin collection changes.

Recycling bins will not be collected if they contain:
- Plastic bags
- Yoghurt pots
- Meat trays
- Butter tubs
- Glass bottles and jars
- Textiles
- Food waste

Changes will include:
- A closed bin policy
- Excess waste will not be collected
- Collection to increase by nearly 2,500 homes in next three years
- One bin only policy

Everything you need to know about bin collection changes.
RICHFIELDS
Designing a world-class infrastructure to facilitate research
Problem → Potential

- Existing datasets not sufficient for understanding consumer behaviour, product development, public health policies
- Every day, consumers & businesses generate “big data”
- Potential to link & analyse data & respond to societal challenges
Phase 3
Design of the research infrastructure
ICT, Business model, Governance, Ethics

Phase 1
Data generated by consumers
Purchase, Preparation, Consumption

Phase 2
Connecting business and research generated data
Business, Existing research infrastructures

needs → output
needs → output

needs ← output
needs ← output
What kind of recordable activity relates to food preparation?

**Domestic food preparation**

- **Planning & organisation (food skills)**
  - Documenting/ recording food: e.g., shopping lists, pantry lists, fridge contents lists, expiration dates
  - Meal/menu planning: e.g., meal plans (including daily, weekly, monthly plans); meal choices

- **Knowledge & understanding (food skills)**
  - Recipe management: e.g., recipe collections; user inputted recipes
  - Sharing knowledge & experience: e.g., ‘favouriting’, bookmarking, reviews; ratings; sharing via social media
  - Searching for information: e.g., Free search of recipe database, ingredient database; glossary terms; filtered searches (incl. meal types, special diet)

- **Meal preparation / cooking (cooking skills)**
  - Using apps as cooking aids: e.g., setting timers, measures and conversions
  - Interacting with sensors: e.g., ‘smart’ kitchen equipment and appliances

**Recordable User Activity**

**User Interactions**

- **Documenting/ recording food**
  - e.g., shopping lists, pantry lists, fridge contents lists, expiration dates
- **Meal/menu planning**
  - e.g., meal plans (including daily, weekly, monthly plans); meal choices
- **Recipe management**
  - e.g., recipe collections; user inputted recipes
- **Sharing knowledge & experience**
  - e.g., ‘favouriting’, bookmarking, reviews; ratings; sharing via social media
- **Searching for information**
  - e.g., Free search of recipe database, ingredient database; glossary terms; filtered searches (incl. meal types, special diet)
- **Using apps as cooking aids**
  - e.g., setting timers, measures and conversions
- **Interacting with sensors**
  - e.g., ‘smart’ kitchen equipment and appliances

**Domain**

**Motivation**

**Richfields**

www.richfields.eu

#RICHFIELDS
Changing data environment

The Internet of Content (IoC): all information created by humans to increase knowledge on particular subjects (e.g. traditional web pages, articles, encyclopedia like Wikipedia, YouTube, e-books, newsfeeds, etc.)

The Internet of People (IoP): all data related to social interaction (e.g. e-mail, Facebook, Twitter, forums, LinkedIn, etc.)

The Internet of Things (IoT): all physical objects connected to the network (e.g. all things that have a unique id and a presence in an internetlike structure. Things may have an internet connection or tagged using RadioFrequency Identification (RFID), Near Field Communication (NFC), etc.)

The Internet of Locations (IoL): refers to all data that have a spatial dimension. With the uptake of mobile devices (e.g., smartphones) more and more events have geospatial attributes.

Source: van der Aalst (2014) Data scientist: The engineer of the future. WMP - Enterprise Interoperability VI
Event data

• most important source of information
• may be “life events”, “machine events”, or both
• may take place inside
  ➢ a machine (e.g., an X-ray machine or baggage handling system)
  ➢ an enterprise information system (e.g., order placed by a customer)
  ➢ a hospital (e.g., the analysis of a blood sample)
  ➢ a social network (e.g., exchanging e-mails or Twitter messages)
  ➢ a transportation system (e.g., checking in, buying a ticket), etc.

Data science questions
Reporting: What happened?
Diagnosis: Why did it happen?
Prediction: What will happen?
Recommendation: What is the best that can happen?

Source: van der Aalst (2014) Data scientist: The engineer of the future. WMP - Enterprise Interoperability VI
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