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Food Literacy: Insights from UK Nutrition and Health Professionals on an Emerging Concept

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REVIEW PAPER ABSTRACT

Today's foodscape is characterized by an abundance of unhealthy food and food practices, and evidence suggests that this has negatively impacted on people's health and wellbeing, leading to the modern malnutrition of obesity and chronic diseases. Food literacy concept has emerged as a promising tool to help people navigate the food system in a health-enhancing manner and so, take control over their dietary practices and behaviours. Food literacy has built momentum by being employed either implicitly or explicitly in dietary interventions, and this led to an increased interest of researchers to establish a shared meaning of the term. This study aimed to explore the current understanding of the food literacy concept and, possibly identify any gaps in the existing literature that may help reach a consensus on its definition and conceptual framework. For this purpose, it provided an overview of the food literacy definitions, components and competencies as well as its association with other health-related concepts, such as nutrition and health literacy. It followed a systematic review approach and discussed 19 paper articles which were selected based on their contribution to the conceptual framework of the term and the understanding of its relationship with other health-related concepts. Although a relatively novel concept, many variations of the definitions, components and competencies of food literacy could be identified in the current literature. This suggests that food literacy concept is subject to the environmental dynamics and, therefore, it calls for understanding and conceptualization in the light of one's personal and environmental experiences. A gap in the existing literature concerned with food literacy education has been identified through the absence of any research on this topic conducted in the UK context.

Key words: food literacy, definition, components, competencies, nutrition literacy, health literacy, review

Conceptual perspectives on Food Literacy: A review

1. Introduction

1.1 Why is Food Literacy important?

Food has always been an essential requirement for human survival and evolution. Part of our living conditions, food is also a matter of lifestyle and central to people's relationship with their environment (Stinson, 2010). Everyday practicalities concerning food may shape and are shaped by people's cultural beliefs and social interactions (Slater, 2017). As such, food can culturally and socially exclude or bring people together, having been described as 'one of the means by which society creates itself and acts out its aims and fantasies' (Visser, 1989). In relation to one's health, food has a dualistic nature: the friend or the foe of humanity. On one hand it can support people's health and wellbeing and on the other hand it is one of the modifiable risk factors responsible for the historical levels of chronic diseases and modern malnutrition - obesity (Bifulco & Caruso, 2007; Daniels et al., 2005; Popkin, 2006; World Health Organisation, 2003). Approximately 63% of global deaths are attributed to chronic diseases, such as cardiovascular diseases, cancers, chronic respiratory diseases and diabetes (WHO, 2013). Since 1975, obesity has nearly tripled worldwide, and data shows that 39% of adults were overweight while 13% were obese in 2016 (WHO, 2018). Extensive research work of Lang (2003), Popkin and colleagues (2012) suggest that the contemporary food systems have grown too complex and difficult to navigate in a healthy manner and this may negatively impact on people's food choices and healthy eating habits. Never before people seemed more food centred, but at the same time more disconnected from the 'right' food to eat (Bellotti, 2010). In addition, evidence reports that unhealthy dietary practices may be linked to poor knowledge about food and the origins of food. A recent study conducted by the British

Nutrition Foundation in 2013 found that one-third of young children believed that pasta came from animals (BNF, 2013). In light of these challenges, it has become increasingly urgent that public health professionals work towards restoring the beneficial role of food so that it is used as an asset to support people's health and wellbeing. In this context, the 'food literacy' (FL) concept has emerged as a promise to re-connect people with their food and foster healthy food relationships (Colatruglio & Slater, 2014). Bellotti (2010) argues 'food literacy provides a framework for rediscovering our relationship with food, learning how our food choices impact on our health, our environment, and on the businesses and communities that provide our food'.

1.2 From Literacy to Food Literacy

For a better understanding of the FL concept, it is essential that 'literacy' is defined both as a 'stand-alone' term but also in relation to food and food practices. According to the United Nations Educational, Scientific and Cultural Organization (2006), literacy is 'the ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts'. Central to the field of education, literacy is playing a critical role for self and social empowerment and can also be understood as 'reading the word and the world' (Freire & Macedo, 1987). Literacy's infusion to the 'world of food' has led to the formation of concepts like nutrition literacy (NL) and FL (Benn, 2014). FL seems to be the latest 'magic bullet' which is currently being discussed in the public health arena with the aim to provide a comprehensive conceptualization of the term which may be applied in health interventions to support and maintain people's health and wellbeing through food education (Gallegos & Vidgen, 2010).

1.3 Rationale for this overview

Extensive work to define the concept of FL and construct a conceptual framework has been conducted in the last decade. While the attempt to conclude on a shared meaning of the term is laudable, the outcomes of the research work differ from initiative to initiative (Truman et al., 2017). It is worth noting the challenges occurring in trying to reach a consensus on the FL definition and key features. These challenges may range from the health intervention context which integrates the term and its components (school programs, community food projects, health and nutrition practices), the methods used to conceptualize the term (theoretical, empirical) the target population (adults, young people, children) the policy context (national, international health diet policies) (Vidgen & Gallegos, 2011). These challenges towards reaching a common understanding of the term suggest that FL is highly contextual, therefore it should be explored, defined and conceptualized in the light of the current socio-cultural determinants, environmental contexts and personal experiences with food-related practices. Despite these variations in defining the term and its key attributes, It has been argued that FL can be used as a successful tool to facilitate a positive relationship with food to promote health and well-being (Slater, 2017). As such, it is widely employed in dietary behaviour change programmes, some examples include Food Literacy Center in Sacramento, California (Stott, 2018), Locally Driven Collaborative Projects on Food Literacy (Ontario Dietitians in Public Health, 2018), Cooking Up a Food Literacy Course, Australia (Adult Learning Australia, 2018). Recently in western society, it has also been acknowledged that Home Economics teachers may play an important role in delivering the FL education (Pendergast, Garvis & Kanasa, 2011). As such, in countries like the USA, Canada, Australia the food literacy concept is being promoted as an essential curriculum subject in schools (Nowak, Kolouch, Schneyer & Roberts, 2012; Powell & Wittman, 2018; Nanayakkara, Margerison & Worsley, 2017).

Meanwhile, in the UK school system, the FL concept is implicitly employed in healthy eating education. For example, in secondary schools, the delivery of the nutrition curriculum in the context of preparing healthy, enjoyable meals, aims to go beyond the general, basic nutrition knowledge and equip students with food skills attributable to the FL concept (Department for Education, 2016). However, it has been argued that an explicit understanding of the concept is not only desirable but highly imperative in the current complex foodscape. Not only it may enable the development of comprehensive healthy eating behaviour interventions, but it may also open opportunities for lobbying and advocacy for an improvement in the public health system. For instance, FL at the centre of the health and nutrition policy may empower the general public with the skills and knowledge required to ‘read’, ‘understand’ and build a positive relationship with food, one that may enable health and environmental friendly food decisions (Cullen et al., 2015; Palumbo, 2016).

This paper will provide an overview of the FL concept by investigating the existing literature concerned with its conceptualization (definition, components, competencies & key factors), as well as associations with other food-related concepts (nutrition, health, wellbeing). The aim is to highlight the importance of contextualization in defining the FL concept and its key features. By doing so, this review aims to potentially identify any gaps in the current literature which may add to the conceptual framework of FL. Therefore, this review will follow the scoping/systematic review approach and is two-fold, as follows:

- will highlight the differences and similarities concerning the conceptualization of the term (definition, components, competencies)
- will discuss the interplay between FL and other health-related concepts, like NL and health literacy (HL).

2. Method

An initial search of the terms FL in the title of the articles was conducted using the following databases: Web of Science (88), Medline (EBSCO) (38), Proquest (35), Pubmed Central (4). Grey literature and Google Scholar (2100 articles) were also included in the search, however, due to limited time and human resources only the first seven pages on Google Scholar were searched and 65 articles containing FL in their title were generated. The search was restricted to the English language, however there was no limitation on the country of origin or the publication type. A temporal limitation was set from September 2008 to September 2018 due to FL being a relatively novel term which has only recently started to be theoretically and empirically defined and conceptualized. This review included only theoretical research articles or empirical studies which followed a theoretical approach in order to contribute to the FL science concerned with conceptualization of the term as follows: provided a novel definition or built on the existing understanding of the term; articles which discussed the association of FL with health-related concepts (nutrition and health literacy). FL interventions, FL curriculum programmes, studies concerned with developing measuring instruments for FL, articles which treated FL as a secondary or additional subject, master and doctoral thesis were not taken into consideration. The initial search generated 230 article titles which included the terms FL and, after title screening and duplicates removal, only 49 were selected for abstract screening. Out of the 49 records, 18 have been excluded after abstract screening and 15 following inclusion/exclusion criteria. The second search was conducted through cross-referencing and this generated 3 more articles relevant to this work. As a result, 19 paper articles were included to be analyzed for full review and discussed in the present work.

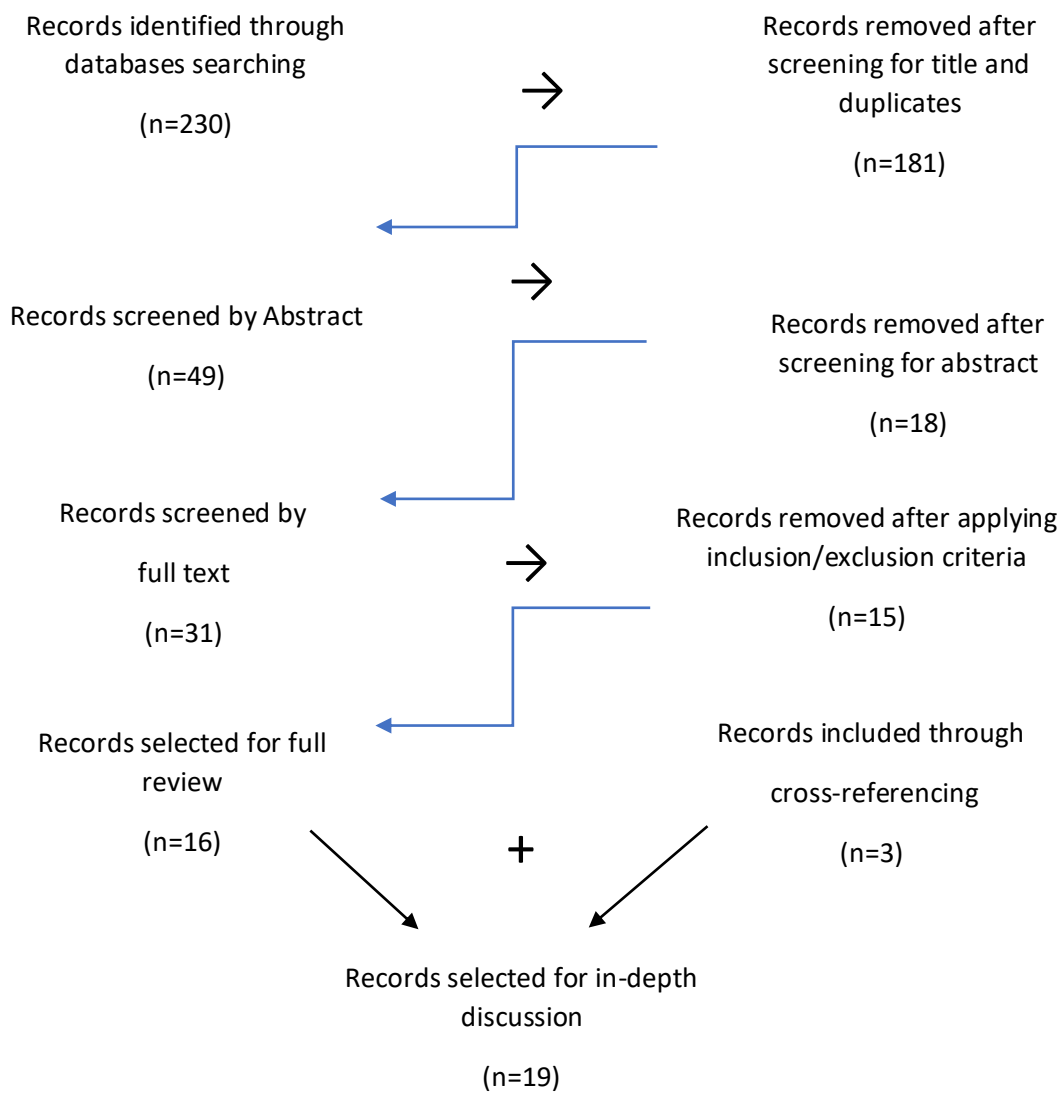


Figure. 1 Literature review flow chart

Table 1 contains definitions/brief extracts from the general perspective on FL revealed in the paper articles selected to be discussed in the present review:

Table 1. Food Literacy Conceptual Framework

Authors	Definitions/General perspectives (by Country)	Components & Competencies	Association with Nutrition & Health Literacy
Australia			
Bellotti, 2010	‘...a concept involving three main domains; food, nutrition and health; agriculture, environment and ecology; and social development and equity’.	X	
Pendergast & Dewhurst, 2012	‘a useful way of examining the interplay between social, political, economic, and environmental aspects of many food issues’.	X	
Vidgen & Gallegos, 2011	‘The relative ability to basically understand the nature of food and how it is important to you, and how able you are to gain information about food, process it, analyse it and act upon it’.	X	
Vidgen & Gallegos, 2014	‘...a collection of interrelated knowledge, skills and behaviours required to plan, manage, select, prepare and eat food to meet needs and determine food intake. Food literacy is the scaffolding that empowers individuals, households, communities or nations to protect diet quality through change and support dietary resilience over time’.	X	
Velardo, 2015	‘There has similarly been a gradual emergence of literature under the umbrella terms nutrition literacy and food literacy that explicitly focus on health literacy skills in a food context’.		X
Worsley, 2015	‘Nutrition science is important as one component of food literacy; understanding of people’s food practices is another.’		X
Canada			
Cullen et al., 2015	‘Food literacy is the ability of an individual to understand food in a way that they develop a positive relationship with it, including food skills and practices across the lifespan in order to navigate, engage, and participate within a complex food system. It's the ability to make decisions to support the achievement of personal health and a sustainable food system considering environmental, social, economic, cultural, and political components’.	X	
Perry et al., 2017	‘...a complex phenomenon’...incorporates intrinsic attributes (food and nutrition knowledge, food skills, self-efficacy and confidence) and extrinsic (ecological components: socio-cultural influences and eating practices)’.	X	
Colatruglio & Slater, 2014	‘The concept of ‘food literacy’ has emerged as a possible framework and promising approach to re-define what people need to know and be able to do with respect to food for individuals, families and communities to be healthy and live well within our current food world and preserve it for future generations’...’food literacy can be seen as an integral “thread” running through conceptualizations of well-being, profoundly influencing the quality of individual and community life’.	X	
Slater, Falkenberg, Rutherford & Colatruglio 2018	‘Food literacy Framework: Three domains: (1) Functional Competencies: Confidence and Empowerment with Food; (2) Relational Competencies: Joy and Meaning through Food; (3) Systems Competencies: Equity and Sustainability for Food Systems’	X	

Smith, 2009 ¹	'way to move beyond food nutrient knowledge, "nutritional literacy" to food systems, issues'.		X
Sumner, 2013	'...the ability to "read the world" in terms of food, thereby recreating it and remarking ourselves. It involves a full-cycle understanding of food –where it is grown, how it is produced, who benefits and who loses when it is purchased, who can access it (and who can't), and where it goes when we are finished with it. It includes an appreciation of the cultural significance of food, the capacity to prepare healthy meals and make healthy decisions, and the recognition of the environmental, social, economic, cultural, and political implications of those decisions'.	X	
Truman et al., 2017	'...describes the idea of proficiency in food related skills and knowledge. Food literacy incorporates components of six key themes or domains and attributes of both critical and functional knowledge'.	X	
USA			
Block et al., 2011 ²	'...more than knowledge; it also involves the motivation to apply nutrition information to food choices. Food Literacy entails both understanding nutritional information and acting on that knowledge in ways consistent with promoting nutritional goals and food well-being. Food Literacy has three main components; conceptual or declarative knowledge, procedural knowledge, and the ability, opportunity, and motivation to apply or use that knowledge'.	X	
Bublitz et al., 2011 ³	"...expands traditional measures of nutrition knowledge to include not only what people know about food but their ability to use that information to facilitate higher levels of food well-being'.	X	
JAPAN			
Kimura, 2011	'an individualized understanding of food choice, dietary behavior, and culinary practices'.	X	
DENMARK			
Benn, 2014	'Food literacy can be seen as skills, competencies, knowledge, behaviours and self-attributes regarding a functional, interactive and critical level...'described as knowing, doing, sensing, wanting, caring, all together as being practical prudent at a personal level but also regarding food, and meals together with others in everyday life.'	x	
ITALY			
Palumbo, 2016	'...concerns the ability to collect and process relevant information to properly use food in a perspective of enhanced physical and psychic well-being'.	X	
SWITZERLAND			
Krause, Sommerhalder, Beer-Borst & Abel, 2016	...' both nutrition literacy and food literacy are specific forms of health literacy'... nutrition literacy can be seen a subset of food literacy'...' We suggest using the term food literacy instead of nutrition literacy to describe the wide range of skills needed for a healthy and responsible nutrition behaviour'.		X

^{1,2,3} - records included through cross-referencing

3. Discussion

FL is a complex, multifaceted construct and this has been clearly highlighted by the wide variety of definitions and conceptual frameworks existing in the literature. Following an in-depth review of the selected paper articles, the FL concept was examined from two perspectives: 1) from the perspective of defining the term and identifying its components and competencies; 2) from the perspective of its association (differences and similarities) with other health-related concepts: health and nutrition literacy.

3.1 Food literacy definitions, components and competencies

The literature search revealed that, while there is a vast variety of definitions of FL, the majority act as descriptors of the concept by highlighting the roles of its components and competencies needed to be food literate. A detailed analysis of these descriptions reveals three main sets of competencies/skills or components concerned with 'knowing, doing, sensing, wanting, caring' about food (Benn, 2014). These will be broken down and examined below:

- a) Food skills (eating practices, food techniques, meal preparation). These attributes revolve around skills required to plan, manage (access, budget), select, prepare and eat healthy meals (Vidgen & Gallegos, 2014). It involves the capacity to apply the correct food skills and techniques (basic kitchen skills, identify and chose the right equipment, read recipes, handle, store, dispose of food) (Perry et al., 2017) in order to cultivate healthy food practices and prepare healthy meals (Kimura, 2011; Cullen et al., 2015).

b) Food knowledge. The 'ability to read the world in terms of food' (see Sumner, 2013) can be assessed at three levels; functional, interactive and critical level (see Benn, 2014; see Vidgen & Gallegos, 2011; see Slater, 2013; see Block et al., 2011; see Truman et al., 2017; see Perry et al., 2017) as follows:

- the functional level includes basic literacy and numeracy skills to be able to access, and process/understand food-related information
- the interactive level includes interpersonal communication skills required for an individual to actively seek food-related information, be able to share and transfer his knowledge, cooperate with other members in his community in a way that food decisions are both ecologically friendly as well as health and wellbeing enhancing
- the critical level refers to the 'empowerment with food' (Slater, Falkenberg, Rutherford & Colatruglio, 2018) and involves the ability to assess, judge, appraise, interpret the quality of food-related information in terms of accessing, selecting, preparing healthy food; reflect on the food choices and eating practices; recognize the impact of these food practices on one's health, the food culture and the physical environment.

c) Food behaviours. This set of skills incorporate self-attributes such as, confidence and self-efficacy, described by Bandura (1982) as 'one's belief in one's ability to succeed in specific situations or accomplish a task' (see Perry et al., 2017); emotional knowledge reflected in 'people's pleasure from food' (see Block et al., 2011) or experiencing joy and meaning

through food, enjoying varied, novel, cultural foods as well as appreciating local food systems, recognizing the importance of meal sharing (see Slater, Falkenberg, Rutherford & Colatruglio 2018); food attitude and motivations (see Truman et al., 2017) that may enhance people's ability to make use of the food-related opportunities (access and apply the food skills, knowledge and available services) in a way that one's food choices are both healthy and environmentally friendly.

These components and competencies of the FL concept are not mutually exclusive but interconnected and act interdependently, influencing each other to an extent at which food literacy would not be possible if one of these three components is missing. For example, making healthier food choices requires not only the ability to acquire, understand and use food-related knowledge, but also one's motivation and self-efficacy to cultivate healthy eating practices as well as contextual opportunities to apply the correct food techniques in order to prepare healthy meals (see Block et al., 2011). In this work, Block et al. (2011) take a different approach to describe the FL concept by emphasizing different functions of the knowledge as competency in the context of internal motivation and external opportunities to apply this knowledge as follows:

- Conceptual or declarative knowledge – involves knowing about food and its origins, how to access this food information and understand the activities concerning food and nutrition.
- Procedural knowledge – refers to applying this food information to make healthy food choices and perform food activities (shopping, meal preparation) with the ultimate goal to support health and wellbeing
- The ability, opportunity and motivation to identify, understand, interpret, communicate and apply this food information in various contexts

Although the health-enhancing role of FL is widely recognized, it has been argued that Food as Health can no longer justify the impact one's food choice may have on his health in an ever-changing socio-cultural, political environment (Block et al., 2011; Bublitz et al., 2011). This new perspective takes FL to a new level, seen as a key requisite to achieve Food as Wellbeing which is described as 'a positive psychological, physical, emotional, and social relationship with food at both the individual and societal levels'. Moving forward, this led to the conceptualization of Food Wellbeing Pinwheel which takes a more holistic, integrative approach by placing the FL concept in the context of other food-related concepts like food availability, food policy, food marketing, and food socialization. By doing so, they argue that, the ultimate goal of FL should be food wellbeing and this can only be achieved by taking in consideration the impact of the socio-cultural, politico-economic factors alongside individual motivations and abilities. Colatruglio and Slater (2014) also discussed FL in the context of wellbeing arguing that, since being food literate goes beyond one's physical health status, it is a vital aspect to living well and has the potential to improve one's life quality through re-establishing positive, healthy relationships between people and their food.

The impact of contextual factors on FL is a recurring theme within the literature concerned with the conceptualization of the term. Once criticized by Kimura (2011) for being highly individualized and gendered due placing the responsibility on the individual, more precisely on 'women's shoulders' to be food literate, the view on FL has progressed to placing the food literacy at the interaction of three spheres of actions: the individual, the community and the environment (see Pendergast & Dehwurst, 2012; see Truman et al., 2017; see Bublitz et al., 2011; see Sumner, 2013). Vidgen & Gallegos (2014) considers FL as an opportunity that empowers not just the individuals and their households but the whole community and even the nation to make healthy food choices and become dietary resilient over time. Perry et al.

(2017) make a clear distinction between the role of the individual (intrinsic) attributes: food skills, knowledge and behaviours and the role of ecological components (extrinsic): socio-cultural influences, eating practices. Bellotti (2010) places FL at the interaction of three sets of domains; food, nutrition and health; agriculture and environment; social development and equity. He argues that FL has the power to reconnect the city (consumers) with the country (the farmers). Slater and colleagues (2018) also acknowledged that FL is at the interplay of environmental aspects such as security and sustainability of food systems, social equity and the role food corporations play in this dynamic system. Recent work of Palumbo (2016) concerned with the effect of FL on the sustainability of wellbeing suggests that FL 'implies a complete understanding of the food system and of its social, economic, and environmental issues'. He states that FL 'concerns the ability to collect and process relevant information to properly use food in a perspective of enhanced physical and psychic well-being'.

3.1.1 Concluding remarks for Part 3.1.

Overall, FL concept is seen as a protective factor, acting as an asset rather than a barrier in helping people to make healthier food choices (see Vidgen & Gallegos, 2014). It is noteworthy the encouragement for people to create a positive relationship with their food (see Cullen et al., 2015; Colatruglio & Slater, 2016) in order to navigate through the food systems, 'make their way out of the unsustainable food environment, recreate their food culture and remark themselves as active participants (see Sumner, 2013). The interconnection and interdependence between the individual and community's food choices and the environment, suggests that FL is a dynamic process and cannot be divorced from the environmental context. Its components and competencies are not static, but they are subject to fluctuations and changes through a continuous learning over the course of a life-time (see Cullen et al., 2015; see Vidgen & Gallegos, 2014).

To summarize, FL encompasses food-related skills, knowledge and behaviours required to make healthy dietary choices that support not only people's health and wellbeing, but also the health and sustainability of the physical environment. In other words, it empowers the individual and the community with critical, functional and interactive competencies to navigate the food systems and food culture in a positive manner that confers protection and support for health and wellbeing within various experiential contexts.

3.2 Food literacy built on health literacy and beyond nutrition literacy

The literature review showed that, at its core, FL involves competencies needed to maintain a healthy dietary lifestyle with the ultimate goal to improve, support and maintain one's health. This viewpoint justifies the interest of several authors to consider FL through the lens of HL and NL frameworks (Smith, 2009; Velardo, 2015; Krause, Sommerhalder, Beer-Borst & Abel, 2016; Worsley, 2015). Next, this review will discuss the transition from health to nutrition literacy and ultimately FL with an emphasis on both the similarities as well as their distinctive elements.

The term of HL has entered the field of health promotion more than thirty years ago and initially referred to the 'ability of patients to read and comprehend things like prescriptions, appointments, and other health-related materials' (Rootamn & Ronson, 2005). The concept was later elaborated by Nutbeam (2009) who offered a more comprehensive definition: 'the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health'. Similarly, Sroensen (2012) refers to HL as the 'knowledge, motivation and competencies to access, understand, appraise, and apply health information in order to make judgments and make decisions in everyday life concerning healthcare, disease prevention and health promotion, to maintain or improve quality of life during the life course'. In the face of ever-

increasing diet-related health conditions, applying basic dietary information is vital for health protection and promotion, therefore nutrition knowledge may be considered a key competency for HL (Velardo, 2015). In this context, promoting nutrition science as a health protection mechanism became a sensible and desirable goal (Worsley, 2015). Nutrition science was originally defined as ‘the science of foods and the nutrients and other substances they contain, and of their actions within the body (including ingestions, digestion, absorption, transport, metabolism, and excretion)’ (Whitney & Rolfes, 2002). This approach opened a new area of research, one that focused on single nutrients (salt, sugar, fat) or single foods (meat, whole milk, egg) as risk or protective factors for people’s health. This narrow view of nutrition science led to the so-called concept of ‘nutritionism’ and encouraged finding individualistic solutions to complex public health nutrition problems (Scrinis, 2013). Although this nutrition paradigm made sense for many decades, it soon became clear that practices based on treating nutrient deficit or excess are no longer a viable solution for improving people’s health and wellbeing (see Worsley, 2015). Moving forward, understanding the socio-cultural context, the environment, people’s abilities and motivations seemed to hold the key to a more comprehensive approach towards sustainable health. As such, nutrition science evolved as an educational goal leading to the concept of NL (Smith, 2009). Initially understood as ‘a specific form of health literacy’ (Blitstein & Evans, 2006) or ‘health literacy applied to the field of nutrition (Watson et al., 2013), it, eventually, seemed sensible and appropriate to base NL’s definition on the HL construct by just replacing ‘health’ with ‘nutrition’. Therefore, NL can be defined as ‘an individual’s capacity to obtain, process, and understand basic nutrition information necessary for making appropriate nutrition decisions (see Blitstein & Evans, 2006; Silk et al., 2008; Zoellner et al., 2009). Guttersrud et al. (2014) take NL to the next level by suggesting that to be nutrition literate, individuals should be able to evaluate the quality of

nutrition information as well as to be willing to take action towards improving their health, however, taking in consideration the wider context of social and global movements. This viewpoint suggests that a close evaluation of the quality of nutrition information may offer individuals the possibility to make healthier, well-informed food choices, but that these dietary practices should also be examined from a wider perspective by taking in account the environmental context. From this standpoint, the NL concept seems insufficient to explain the complexity of making healthy food choices or inform on the skills required to cultivate health-enhancing dietary practices (Worsley, 2015). Under this pretext, NL emerged as a promise to fill this gap by integrating the competencies to ‘obtain, understand, appraise and use and apply basic nutrition information’ (Krause, Sommerhalder, Beer-Borst & Abel, 2016). These competencies (food skills, knowledge and behaviours) have been discussed in the first part of this review.

Following Nutbeam’s tripartite model of NL examined through its functional, interactive and critical dimensions, a few authors have adopted and re-produced a framework for nutrition and NL concepts to highlight the similarities as well as their distinct elements (Smith, 2009; Krause, Sommerhalder, Beer-Borst & Abel, 2016; Velardo, 2015). This grid has been adapted and reproduced below:

Table 2. Conceptual framework for health, nutrition and food literacy

Literacy concept	Functional	Interactive	Critical
Health	The ability to obtain, understand and use basic health information.	To utilize different forms of communication to obtain, provide, and apply relevant health information The ability to act on the nutrition information and, successfully, improve health;	The ability to critically evaluate and reflect on health information and advice. To understand and recognize the wider social determinants of health.
Nutrition	The ability to obtain factual nutrition information and develop an understanding of factors that can enhance or inhibit good health. It requires basic literacy and numeracy skills.	The ability to translate nutrition knowledge into positive dietary choices. The development of more complex skills, motivation and confidence required to navigate the food system. It requires cognitive and interpersonal communication skills.	The capacity to act on and influence the underlying social determinants of health; It requires critical appraisal skills alongside increased awareness and critical/ emancipatory action to address barriers to good nutrition; Challenging deeply rooted socio-cultural norms regarding nutrition and health
Food	The ability to obtain and process basic food and nutrition information and to understand the health benefits/negative consequences of food choices	It requires personal skills like decision-making and goal-setting with the aim to make health-enhancing food choices. The ability to share food information, transfer food skills, cultivate the joy of 'social eating', explore the meanings of food.	The ability to appraise the quality of nutrition information and reflect on the influence of food choices on one's health and wellbeing. Understanding the interconnections between food, society, and health by considering the wider impacts of individual and community's dietary practices on the environment. Taking into consideration moral and ethical values, challenging old sociocultural norms regarding food and advocating for change to improve food policies and practices

3.2.1 Concluding remarks for Part 3.2.

FL emerged as a result of health professionals' efforts to encourage individuals to make better choices for their health. Food and nutrition programs and interventions serve as tools to empower people with the skills, knowledge and behaviours required to make health-enhancing food choices. In this context, FL and NL have coexisted and complemented each other like disciplines, both acting as subsets, distinct forms of HL (see Krause, Sommerhalder, Beer-Borst & Abel, 2016; Velardo, 2015)

4. Conclusion

FL is a relatively new concept that seems promising in supporting people to understand the complexity of food systems in a way that they build a positive relationship with food and empower them with skills, knowledge and behaviours to make healthy and environmentally friendly food choices.

The present review aimed to offer a comprehensive understanding of the concept of FL in order to identify and inform on possible gaps existing in the current literature. It has been revealed that the majority of studies have focused on constructing a conceptual framework concerned with the definition of the term, its main components and competencies. The wide variety of definitions and competencies discussed in this paper suggests that FL is a complex, multifaceted and highly contextual concept and that it should be defined in conceptualized in the light of one's experiential contexts. While recognizing the importance of having a shared meaning and common understanding of the term, it becomes increasingly important to expand this knowledge to identify the challenges and opportunities that may impact on FL. Questions like, 'what are the key determinants that impact on FL?', 'what are the challenges and opportunities that may enhance/obstruct the development of FL competencies in the current food environment?', are waiting to be answered and invite for further research.

4.1 Recommendations for further research:

To date, the concept of FL has not been explored, defined or conceptualized in the UK context. However, its implicit use in school curriculums and dietary interventions suggests not only the interest but also the opportunity for further elaboration of the term. It is, therefore, recommended that FL is further explored from the perspective of the UK current food environment so that practitioners and policy-makers can make explicit and correct use of it. Moreover, future research should focus on the challenges and opportunities one may experience in becoming food literate and the key determinants that impact on FL. This will not only enrich the existing literature on this emerging concept but, ideally, will create opportunities for the FL education to be placed within the UK national health policy strategy.

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RESEARCH PAPER ABSTRACT

Globally, food systems continue to grow in complexity and, consequently, it becomes more difficult for people to engage in healthy food practices. This 'food confusion' may lead to unhealthy eating patterns and, consequently to diet-related diseases. This concern urged health practitioners and public health policy-makers to find optimal solutions to re-connect people with their food in a health-enhancing manner. The 'food literacy' concept emerged as a promising tool to foster positive food relationships and so, help people maintain and improve their health. It has been argued that the components and competencies of food literacy are not static but influenced by one's personal and environmental experiences. There are many variations of the food literacy definition and competencies, however, this concept has not been explored and defined in the UK context.

This study aimed to explore the food literacy concept, its defining components and key determinants in the UK context. The objectives were to capture the views of UK health and nutrition professionals on this emerging concept and construct a conceptual framework of the term. The World Café research technique was employed to explore participants' understanding of the concept of food literacy and the thematic analysis method was used to analyze their views on this topic. The findings revealed a wide range of competencies clustered into two main domains: **Applied Food Education and Empowerment** and **Food Ethics**. Key determinants impacting on food literacy were identified at two levels: Agency (personal capabilities) and Structure (System capabilities). The conceptual framework of food literacy as understood in the UK context as well as identifying the influencing factors may help UK health practitioners and public health policy-makers to use food literacy explicitly in health-promoting dietary interventions and food education programmes.

Key words: food literacy, definition, components and competencies, key determinants, applied food education and empowerment, food ethics, nutrition and health professionals, agency and structure, world café meeting.

1. Introduction

1.1 Background

Evidence demonstrates that the ever-complex contemporary food environment may have a negative impact on people's relationship with their food (Bellotti, 2010; Lang, 2003; Scrinis, 2013). There are also concerns that food and nutrition knowledge and skills in the general population have been dramatically diminished in the last few decades (Daniels et al., 2005; Popkin, 2006; Popkin, Adair & Ng, 2012). Consequently, this 'de-skilling' had led to serious public health concerns regarding historical obesity levels and diet-related chronic diseases (Clutler, Glaeser & Shapiro, 2003; Jaffe & Gertler, 2006). Identifying optimum strategies to promote healthier eating patterns is not only desirable but increasingly urgent (Perez-Rodrigo & Aranceta 2001). Food literacy (FL) emerged as a promise to restore people's necessary skills and knowledge to engage in healthy food practices and behaviours (Desjardins et al., 2013).

There have been many variations and proposed definitions aimed at describing the concept of FL and its components. A basic definition of the FL refers to one's ability to be proficient in food-related skills, knowledge and behaviours (Truman et al., 2017). Vidgen and Gallegos (2014) refer to FL as the everyday practicalities involved in healthy eating behaviour. Such activities encompass the skills and knowledge required to navigate the food systems in such an efficient, safe and confident manner that one's food choices align with the recommended health and nutritional guidelines (see Vidgen & Gallegos, 2014).

1.2 Justification for this research

It has been argued that FL requires building a positive relationship with food, one that may empower people to make healthier food choices to improve and maintain their health. This relationship is not static, but a dynamic process influenced by the socio-cultural and environmental experiences that impact on people's food-related skills, knowledge and behaviours (Cullen et al., 2015). This suggests that FL is highly contextual and, therefore, it should be understood, conceptualized and defined in the light of personal experiences and environmental contexts. FL is an emergent concept which has not received much attention in the UK and, as such, its application is performed at an implicit level. For example, the British Nutrition Foundation Programme - 'Food- a fact of life' promotes healthy eating practices to children by making use of literacy and numeracy (BNF,2018). This suggests that there is an interest in bringing literacy and numeracy into the food domain and that the importance of being literate to navigate the food systems more efficiently is acknowledged. An inquiry into the FL in the UK context may contribute to a better understanding of the concept and enable public health professionals to utilize it explicitly, therefore more efficiently in health-enhancing dietary interventions.

1.3 Aim and Objectives

The aim of this study was to explore the concept of FL in the UK context. The objectives were to capture the views of UK Nutrition and Health professionals on the understanding of the FL concept, its defining elements and underpinning factors attributable to the UK context. The findings of this research work may contribute to the scholarly knowledge of the FL concept, its components and key determinants as described in contemporary literature.

2. Methodology

2.1. Ethical consideration

This study was undertaken between May and October 2018 and ethics application was submitted to the University of Chester (UK) Ethics Committee (Appendix 1). The research work was initiated upon ethical approval.

2.2 Research Design: The World Café method

This qualitative research study used the World Café (WC) method developed by Juanita Brown (Steier, Brown & Mesquita da Silva, 2015) to explore and collect health and nutrition professionals' views on the concept of food literacy. This emergent technique of exploring people's opinions assumes that people have the answers 'within them' and that they will be able to access this information during conversations that are thought-provoking and able to generate rich insights (Anderson, 2011). Evidence suggests that people's readiness to engage in meaningful conversations is facilitated by the WC's relationship-building role which may create a practical basis for trusting relationships and so, foster a 'safe' environment for dialogue (Gill, Ramsey, Leberman & Atkins, 2016; Tan & Brown, 2005). The WC process follows seven principles: a) set the context (identify the goals for the meeting, propose the topic to be discussed); b) create hospitable space (create an welcoming atmosphere that enables people to feel safe, comfortable for creative thinking, speaking and listening); c) explore questions that 'matter' (identify the relevant themes for the proposed topic, develop a topic guide with questions that 'travel well'); d) encourage everyone's contribution (encourage everyone to participate in the conversations by sharing ideas or simply listening); e) connect diverse perspectives (invite participants to join other discussion groups and engage in new conversation whilst carrying with them and sharing insights from previous dialogues); f) listen

together for patterns and insights (listen to others opinions but also practice shared listening to pay attention to thoughts and insights); g) share collective discoveries (this is the ‘harvest’ stage when the collective perspectives are summarized and shared with all the participants in the room) (The World Café Community Foundation, 2015). Given its purpose and principles described above, the WC data collection technique seemed appropriate for exploring and capturing health and nutrition professionals’ insights on the emerging concept of FL.

2.3 Data Collection

There were two WC meetings organized, under supervision, and moderated by the lead researcher. Each meeting lasted approximately 90 minutes and the allocated time was divided as follows: the lead researcher introduced the topic of FL and explained to the participants what was expected from them (approx. 10 min.); three 20-min. rounds (one question per round) and a summary session to briefly present the outcomes of the collaborative dialogues (participants comments/findings) (approx. 15 min). For the purpose of these meetings, the lead researcher developed a topic guide containing three key questions (Table 1) to be discussed during the meetings. Participants were invited to join groups of three to four people and engage in collaborative dialogues on the key themes set out in the topic guide (see appendix). A ‘table host’ was briefed on the themes to be explored and assigned to note down participants’ insights/comments on the flipcharts/paper materials provided.

Table 1. Food Literacy Topic Guide	
Q1	What do you understand by the term ‘food literacy’?
Q2	‘...what do you think are the challenges & opportunities that may impact on “food literacy” within the UK context?’
Q3	‘How can people in the UK build a positive relationship with food to better support their health and wellbeing?’

2.4 Recruitment process

This study involved a purposive sampling strategy based on snowballing sampling (Harris et al., 2009). Initially, potential participants have been identified from the lead researcher's professional connections, based on the following inclusion/exclusion criteria:

Inclusion criteria:

- Participants to have at least one of the following professional backgrounds/academic degrees in Nutrition/Food/ Exercise/Health
- Participants able to speak and understand the English language at an academic level.

Exclusion criteria:

- members without food and nutrition, exercise and health professional background
- non-English speakers or members who cannot understand the English language at a professional level.

Once a small number of potential participants had been selected, they were sent a registration form (Appendix 4) by an email invitation (Appendix 5) and were also asked to nominate other potential participants. Each participant was allowed to take part in only one of the two WC sessions. The optimal sample size for the WC meeting is dictated by the desired outcome and the complexity of the proposed topic to be explored, ideally, groups of four to six participants discussing one single theme per round (see Gill, Ramsey, Leberman & Atkins, 2016; see The World Café Community Foundation, 2015). The topic guide proposed for this study contained three main questions (Appendix 6), therefore the optimal sample each WC session would have ranged from 12 to 18 participants. In total, there were 22 participants in both meetings: 10 and respectively 12 guests, as described in the table below:

Table 2. Participants' job titles/expertise		
World Café meetings	1	2
Participants/Job Title	(n=10)	(n=12)
Public health nutritionist/consultants	5	
Academic lecturers in Food and Nutrition Science	1	4
Research experts in food and agriculture Science		3
Ph.D. student in nutrition sciences/community development sciences	1	1
Food, nutrition and health community-based project managers/professionals		3
Academic professor in applied linguistics		1
Dietitian	1	
Food specialists	2	

2.5 Data Analysis

At the end of each WC session, the paper materials containing participants notes/comments/insights were collected and anonymously transcribed by the lead researcher. Once transcribed, the notes were analyzed using the thematic analysis method proposed by Braun & Clarke (2006). The procedure involved six stages of coding data and identifying the pattern (themes) within the transcripts, as follows:

1. The lead researcher read and re-read the transcripts to become familiar with the data sets and initial ideas were noted down.
2. Initial codes were generated by systematically coding the relevant features of the data across the entire data set and collating data relevant to each code.
3. Searching for themes by collating codes into potential themes; identifying all data specific to each potential theme.
4. Reviewing themes by checking if the themes were relevant to the coded data extracts (level 1) and the entire data set (level 2); a thematic map' of the analysis was created.
5. Themes were named and defined by ongoing analysis conducted to refine the specifics of each theme.

6. The final stage involved producing the present report based on a final analysis developed by relating back the selected extracts to the research question and literature.

3. Results

The findings of this study were organized into two categories: components and competencies aimed to define the FL concept as understood in the UK context and the key determinants represented by the challenges and opportunities that may impact on its understanding and development.

3.1 Components and competencies of FL.

Following the thematic analysis, the components and competencies of FL were clustered into two main domains: **Applied Food Education & Empowerment** and **Food Ethics**. Each domain revealed further sub-categories and sub-themes as presented in Figure 1:

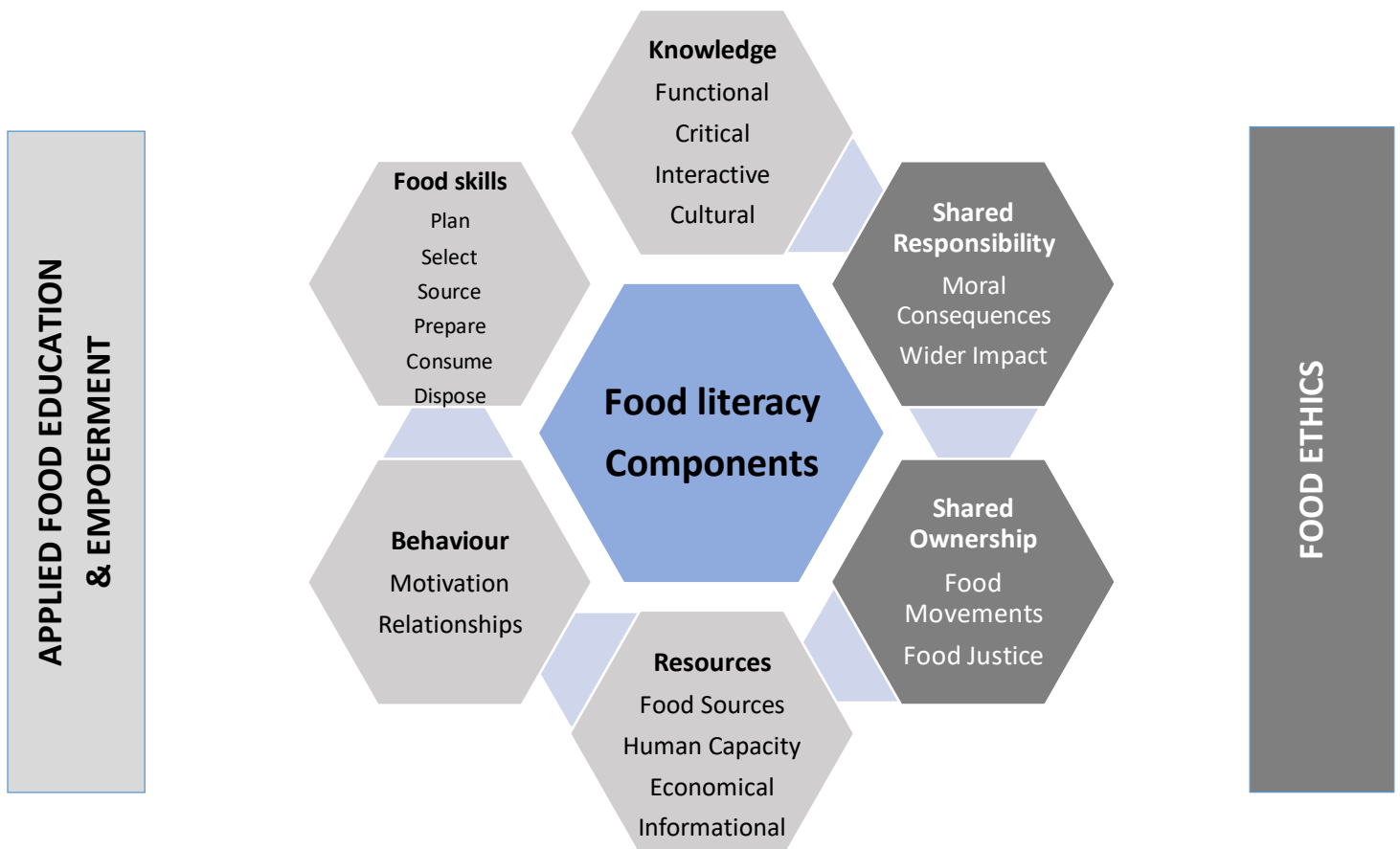


Figure 1. Components and competencies of FL.

A description of each domain and sub-theme accompanied by anonymous quotes' extracts is presented below:

Table 3. FL components & competencies.

Applied Food Education & Empowerment			
Competencies	Description	Quotes	
Food Knowledge	Functional	The ability to access, understand and use food-related information	<i>'People who are able to read and understand' 'Link between food literacy and food education' 'Children and parents understanding of where food comes from' 'Food labelling plays a major role'</i>
	Critical	The ability to critically appraise and interpret food-related information so to be able to select the 'appropriate' decisions regarding food quality and implications for the food systems and environment	<i>'Educating people about better/healthier ways of eating and understanding the benefits of informed decision. 'Knowing how food is good for you physically, spiritually, mentally'...'more than healthy eating' 'Food literacy vs. confusion on food' '...informed choices-being able to confidently interpret messages'</i>
	Interactive	One's ability to use interpersonal communication and relational skills to actively seek food-related information, responsibly engage in food practices, be able to share his knowledge, cooperate and transfer his food expertise within community members and between generations	<i>'...knowledge about what is healthy vs. knowing how to access healthy food' 'Communication to people on how they can purchase, cook and prepare food' '...celebrate food appropriately on behalf of the community'...'meals/eating together' 'Sharing of knowledge – both cultural and intergenerational' 'Encourage conversations around food'</i>
	Cultural	It takes into account differences in food culture, such as food habits, traditions, food practices, food meanings, cultural values and perceptions regarding food and food environment. It considers the need to respect, protect and support various food cultures.	<i>'It is not so much 'religion' as it is about different cultures – which means different cooking techniques, different understandings' 'It varies with different cultures/contexts' 'Consideration of traditional and cultural foods' 'Cultural influences - family traditions' 'Exposure to more variety of foods' 'Capturing diversity'</i>
Food skills	Plan Select Source Prepare Consume Dispose	It requires one's ability to plan and manage their personal and physical resources to select and source healthy food, be able to apply cooking techniques to prepare healthy meals, sensibly and safely consume and dispose of food.	<i>'...the ability to understanding to source, manage, prepare, consume'...' how to budget and plan food, shop et al'...'how to grow food, source/manage/prepare' 'Not about food on the plate, but how it gets to the plate - so this includes storage, preparation, cooking facilities, cooking skills & knowledge, etc.'</i>
Food Behaviours	Motivation	It involves the set of actions, drives and incentives that have the 'force' to set the direction of the eating behaviour.	<i>'Can we fuel food curiosity with children to improve food literacy?' 'Reasons people do not make healthy/sensible food choice go beyond the ability to cook/knowledge' '... nourishment (biological); nutrition (holistic)' 'Belonging...' 'Esteem - accomplishment/skills' '...Self-actualization - Food literate' 'Food literate doesn't necessarily mean that those will make better choices'</i>
	Relationships	It refers to the interdependent associations between: people and food; food and health; individual/family/community and food systems	<i>'Disconnected relationship of food and health' 'How a citizen interacts with food in an appropriate way' 'Eating together opportunities; farmers, growers, families, open up to communities' 'State; Industry; Consumers'</i>

Resources	Food sources	It promotes food literacy education through the food and food procurement facilities available to the population	<p><i>'Was food better years ago? Lost way of cooking to convenience foods?'</i></p> <p><i>'...knowledge has depleted due to convenience'</i></p> <p><i>'...food deserts...'</i></p> <p><i>'Allotments...Food hubs'</i></p> <p><i>'Improve the appearance of healthy food - non-processed - look appealing alternative'</i></p> <p><i>...'convenience, fast-food, processed foods - too many choices'...'ethical food'</i></p>
	Human Capacity	People may act as resourceful tools to support/obstruct food literacy education	<p><i>'Range of stakeholders in the Council, at University et al.'</i></p> <p><i>'Who is our 'health professionals' - PT's, RN, RD - unregulated industry'...'Slimming Industry'</i></p> <p><i>'Illiterate people working in the food industry'</i></p> <p><i>'General population are food illiterate'</i></p>
	Economic	The role financial resources play in supporting food literacy education	<p><i>'Funding...'</i></p> <p><i>...'tax on unhealthy food'</i></p> <p><i>'Poverty not equal food poverty (Finances/Literacy) - differences include food literacy'</i></p> <p><i>'Enable access and affordability to healthy food'</i></p>
	Informational	Informational support aimed to engage people in a food literacy learning environment	<p><i>'Coventry Food Charter: ethical practices; procurement; waste et al.'</i></p> <p><i>'Guidance for organizations, schools, et al.'</i></p> <p><i>'The role social media plays?'</i></p> <p><i>...NICE-academic snobbery...'</i></p>
Food Ethics			
Shared Ownership	Food Movements	It refers to a set of multidimensional and collaborative food actions perceived as ethical obligations with a role to support food literacy	<p><i>'Challenge to the food industry to reformulate'</i></p> <p><i>'Government role to facilitate'</i></p> <p><i>'Government play a role in supporting a food literate environment potentially by making healthy food an affordable option?'</i></p> <p><i>'Calorie labelling in cafes and restaurants'</i></p> <p><i>'Food literacy - property of food systems or culture or individuals (individual may not be that food literate) or the media, or policy-makers, or academics, or lobbyists'</i></p>
	Food Justice	Food literacy perceived as having the potential to help people take control over their rights to healthy food; an empowering tool that may support food justice and food equality through closing the gaps between socioeconomic groups by creating a 'common ground' for food and food practices	<p><i>'The right to food (development goals/human right)'</i></p> <p><i>'Gap in the food literacy in the UK socioeconomic groups'</i></p> <p><i>'Food illiterate/illiteracy is not a good term to use in community settings, it leads to a Top Down divide'</i></p> <p><i>'Common ground: 'everyone has to eat!'</i></p>
Shared responsibility	Moral consequences	Food literacy/illiteracy seen as a shared moral responsibility for all	<p><i>'Shared responsibility between social, cultural, economic + political forms to public'</i></p> <p><i>'Moral responsibility required by Top Stakeholders, i.e. gov, big companies'</i></p> <p><i>Morally conflicted.'</i></p>
	Wider impact	It takes into account the mutual relationship between food literacy components and the sustainability of the environment	<p><i>'Feed - Disposal (waste)'</i></p> <p><i>'Multi-stakeholder impact'</i></p> <p><i>'Impact on economy'</i></p> <p><i>'Food choices affecting wider determinants'</i></p> <p><i>'Complex environment for food literacy'</i></p> <p><i>'Convenience negatively impacting on food literacy.'</i></p>

3.2 Key determinants of FL: Challenges and Opportunities

The thematic analysis revealed that FL is influenced by challenges and opportunities at two levels: at the **Agency** level which refers to the capacity of an individual to make independent choices and act in respect of these decisions (Archer, 2003); the **Structure** level incorporates the wider determinants (beyond self) that influence and determine the Agency's opportunities (see Archer, 2003). The multidimensional relationship between FL's key determinants is presented in Figure 2.

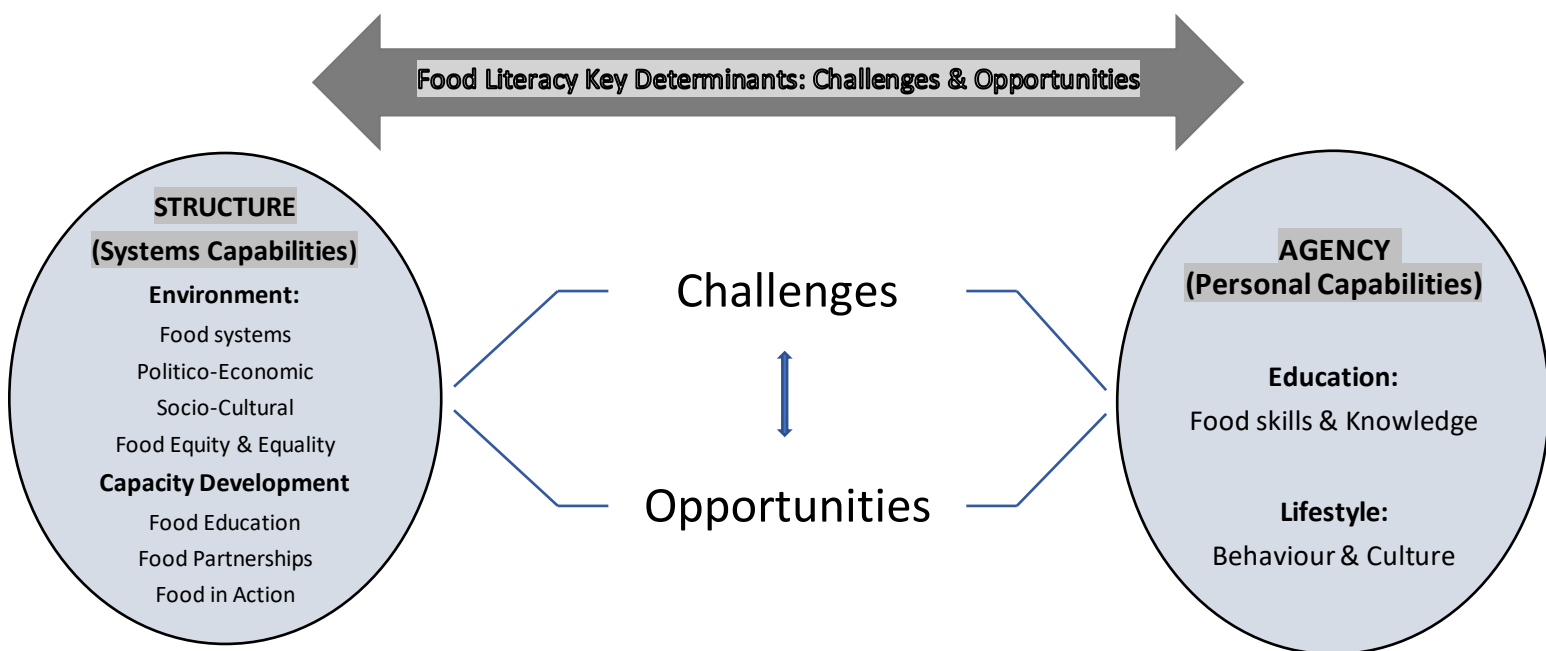


Figure 2. Challenges and opportunities impacting on food literacy.

Table 4 describes the key determinants considered through the lens of the existing challenges and opportunities that may impact on FL:

Table 4. FL key determinants: Challenges & Opportunities

Agency (Personal Capabilities)			
Education	Knowledge	One's ability to acquire food knowledge and understand food practices and theories	'Education - Family-generational cross life course' 'Foods around the world; Knowing where food comes from...' '...understanding the process of food from Farm to Fork' 'Knowledge of food is reduced' 'Implies " illiterate"...'word food literacy isn't familiar term' '...terminology is a barrier'
	Food skills	One's capability to apply the food knowledge through exercising his practical food skills	'Education has two dimensions – knowledge; application' ...'share recipes among different age groups – old & young' 'Not so much about food on the plate, but how it gets there – so this includes storage, preparation, cooking facilities, cooking skills and knowledge, etc.'
Lifestyle	Behaviour	Personal behaviours (interest, emotional state, perceptions, reactions) that have an influence on one's food literacy	'Trade-offs made between other concerns (say, fuel, rent) & food' 'Cost vs health' 'Lack of interest'...'relationship with food-now lost rational'...'connections with food-negligible' 'Food Behaviours Reactive'...'Response to manufacturers & producers' 'Food eating - Food Mood'...'slow food versus processed food' 'Public perception - not wanting to be told what to do'
	Culture	Food choices made in the light of the one's personal culture-based food practices and traditions	'What food means to you...what foods do you enjoy eating? Food culture-based' 'Capturing diversity' 'Tradition (e.g. "fish & chips" or Fish on a Friday' tradition) 'Sharing of knowledge – both cultural and inter-generational'
Structure (System's Capabilities)			
Environment	Food Systems	The food systems behaviour, duties and responsibilities	'Expansion in the number of takeaways & pubs where food is cheaper & easy to access, involves no cooking' 'Food Reformulation - convenience, fast-food, processed foods - too many choices'...'prepared food - disempower, dependant' 'Local food'...' local growing system, local food system' 'Emphasis on manufacturers...'creating an enabling environment' 'Moral and ethical food system;
	Politico-Economic	The influence of the financial, legal and political environment on one's food literacy education	'Brexit' 'Tax-relief for ethical businesses to produce/sell healthy food' 'Food consumption is driven by cost and availability.' 'Nanny State - Gov - comprehensive, cross-path, cross generational & transparent' 'State - Contradictory role'.... 'State backing: funding'
	Socio-Cultural	The challenges and opportunities within the socio-cultural aspect of the food environment	'Developing a sense of 'community' – to share food, knowledge & understanding' 'Community perspective...site-specific: freedom for them to develop grassroots' 'It is not so much 'religion' as it is about different cultures – which means different cooking techniques, different understandings' 'Consideration of traditional and cultural foods. This will help address issues on the food choice of ethnic minority groups'
	Food Equity & Equality	The role social justice may play in enabling food equity and equality - dimensions of food literacy	'Poverty - Equity - impact of changes of benefit system (6wks)' ...'people in deprived areas have the most health issues'...'so how to make sure good food reaches and benefits everybody' 'Food banks, Community shops. Food as a vehicle for Food Poverty' 'Ethical food risks being elitist, so how to make sure good food reaches and benefits everybody'
Capacity Development	Food Education	Educational resources at a macro level that may obstruct/support food literacy (social media, academic institutions, public policies and national guidelines, health professionals, food industry communications)	'Education at two levels – family; institutional (both inside & outside schools, Universities, etc.)' '...elitist term, to educate teachers'...'education in schools' 'Education - early years, active, engaged learning; Fun - more receptive'...'raise children's curiosity...' 'Too much to include all in the curriculum: Core skills: literacy, what is it; basic techniques cooking'...'pressure on children...family pressure'

			<i>'Social media - responsible reposting over-simplified or over complex - confusion, fake news, misinformation'</i> <i>'Media targeting basic cookery skills needed'</i> <i>'...Policy to Include Food and Nutrition'</i> <i>'Conflicting advice vs consistent messages Professional knowledge; Outdated information - update advice'</i> <i>'Clear messages needed, simple, easy to deliver; positive messages'</i> <i>'Packing-misleading'...</i>
	Food in Action	The opportunities for food literacy development through food events, actions and food networks	<i>'Social/community kitchens'</i> <i>'Creating spaces for "sharing of food stories"</i> <i>'Increase attractiveness of food'...'curiosity about food and variation of intake'...generating curiosity around food, not only nutrition; encouraging conversations on food'</i> <i>'Festival, Celebrations'</i> <i>'Marketing & Advertising - fruits & vegetables to children'</i> <i>'Creating entrepreneurial networks'</i>
	Partnerships	Constructive collaborations between stakeholders who have the potential to enable and support food literacy development	<i>'Government link with Pharma; Evidence quality; not funded by Pharma'</i> <i>'Government, Food and Drink Federation, Food Industry'</i> <i>'Facilitate "middle"...'policies & Procedures; Trust; CSO's to pressure govt (MP's)'</i> <i>'People - Consumers; Identity: Localised or Globalised?'</i>

4. Discussion

This study aimed to explore the concept of FL as understood by Nutrition and Health professionals in the UK context. Given this purpose, the questions (Table 2) set out in the topic guide focused on FL defining components and competencies, and key determinants considered through the lens of challenges and opportunities in the UK food environment. In this context, the inquiry into the FL concept can be simplified to **'what defines and determines food literacy?'**

4.1 FL components and competencies

The thematic analysis concerned with the defining components of FL revealed a broad scope of competencies integrated into a comprehensive framework as follows:

4.1.1 Applied Food Education & Empowerment involves competencies such as: Knowledge, Food skills, Behaviours and Resources all aimed to support one's opportunity to become food literate. As with all the previous studies concerned with FL conceptualization (Block et al.,

2011; Bublitz et al., 2011; Perry et al., 2017; Truman et al., 2017) this research work also revealed that **Food Knowledge** is an essential, basic skill, a starting point for FL education. Similarities were also found when exploring the different levels of knowledge, such as functional (obtain and use food information – ‘people who are able to read and understand’), critical (judge and interpret the quality and scope of food information – ‘informed choices’; ‘being able to confidently interpret messages’), interactive (act on the food information by ‘sharing the knowledge’, ‘meals/eating together’). These findings are consistent with a very basic, initial definition of FL formulated by Vidgen and Gallegos (2011) which states that: ‘the relative ability to basically understand the nature of food and how it is important to you, and how able you are to gain information about food, process it, analyse it and act upon it’. The ‘stand out’ element here was the ‘cultural knowledge’ which seemed to receive a different type of attention than how it has been treated in previous works on FL’s components. For example, while of Cullen et al. (2015), Perry et al. (2017), Truman et al., (2017) considered ‘the cultural influence’ as being one of the FL’s competencies, in this study the cultural element was perceived as an education competency and referred to acquiring FL through ‘capturing diversity’ and learn about food through ‘exposure to various foods’, being aware of the different cultural-based shopping habits and consider traditional and cultural foods. Cultural knowledge also incorporated FL’s competency to recognize, protect and respect different food cultures, as Sumner (2015) once stated ‘it includes an appreciation of the cultural significance of food’. That the cultural knowledge was reflected in participants’ speech on FL should not be surprising given the dramatic impact the immigration had on Britain’s cultural environment, a nation now characterized by ‘super-diversity’ (Vertovec, 2007). This finding is supported by previous work of Snyder (2009) who examines the relationship between cooking, cuisine and cultural literacy and concludes that ‘food literacy

is so important to understanding not only our food but our culture'. Stinson (2010) goes so far to suggest that the cultural survival of nations is highly dependent on their renewed understanding of food which incorporates the cultural aspect of food knowledge'.

Food Skills has also been a recurring theme of the majority of studies concerned with FL competencies (Cullen et al., 2015; Kimura, 2011; Perry et al., 2017; Vidgen & Gallegos, 2014). This sub-category revealed practical skills such procurement of food, preparing, consuming and disposing of food, but also learning competencies regarding storage, food safety, food's journey from 'farm to fork'. Given the fast-food culture, characterized by a loss of cooking skills in the favour of convenience foods, processed and prepared meals (Slater, 2013; Slater, 2017), regaining the basic food skills is believed to empower individuals to return to the 'cooking era' and support FL education (see Vidgen & Gallegos, 2014).

Food Behaviours. This dimension of FL has been previously discussed by Perry and colleagues (2017) in terms of one's self-efficacy and confidence to apply the food skills and knowledge in a health and environment-friendly manner. Kimura (2011) also acknowledges dietary behaviour as a component of FL. In this study, one of the food behaviours sub-theme was 'motivation' which referred to a set of intrinsic factors that determine one's attitude, intentions and direction regarding food and food practices. Making use of Maslow's (1987) pyramid of needs, participants analyzed FL at different motivational stages: food seen as a basic need (fuel), developing a sense of 'belonging' through food relationships, acquiring self-esteem through food education and ultimately, achieving self-actualization (fulfilling one's own unique potential), as the end goal of FL. Surprisingly, some participants' notes revealed that 'being food literate does not necessarily mean that those will make better choices'. This understanding that FL education is required, but not sufficient for enhancing one's healthy dietary practices is congruent with Vidgen and Gallegos (2014) findings that 'food literacy is

the **scaffolding** that empowers individuals, households, communities or nations to protect diet quality through change and support dietary resilience over time'. The potential of FL to enhance health and wellbeing has also been debated in previous publications which considered FL as a pre-requisite, one of the many factors underpinning Food Wellbeing described by Block et al. (2011) as a 'positive psychological, physical, emotional, and social relationship with food at both the individual and societal'.

Another sub-theme under this category was the 'food relationships' perceived as having the potential to support FL by re-connecting people with their food, enable positive interactions between food and health at an individual level, community and national level. The importance of building a positive relationship with food to support FL is congruent with Cullen et al.'s (2015) views that 'food literacy is the ability of an individual to understand food in a way that they develop a positive relationship with it...'

Amongst the Applied Education and Empowerment domain, another main sub-category was **Resources**. There were four resourceful components revealed in this analysis: 'food sources' (type of foods available, foodscape), 'human capacity (professionals concerned with food education, general population level of literacy), economic resources (available funding, accessibility and availability of healthy food) and informational resources (social media, public policies and national dietary guidelines). The role of these resources is to support the educational competencies (knowledge, food skills and behaviours) with the ultimate goal to acquire FL. Previous publications mentioned the role of these macro-level resources by referring to them as 'opportunities' (Block et al., 2011) or 'services' (Pendergast, Garvis & Kasana, 2012), or 'the systems competencies' (Slater, Falkenberg, Rutherford & Colatruglio, 2018). However, this domain of external competencies has received much less attention

compared to the educational competency theme, suggesting that they may have a secondary role in the conceptualization of FL (Fordyce-Voorham, 2011).

4.1.2 Food Ethics

Food ethics was revealed, in this data, as a secondary domain incorporating two sub-categories: **Shared Ownership and Shared Responsibility**. It was revealed that FL is at the interplay of many stakeholders (e.g. food industry, consumer, government) and as such, it calls for shared control and ownership. Participants' views suggested that FL may be supported through collective 'food movements' such as: food reformulation, supportive role of government, labelling in cafes and restaurants). These findings are consistent with the understanding of FL as 'a useful way of examining the interplay between social, political, economic, and environmental aspects of many food issues' (Pendergast, Garvis & Kasana, 2012). Bellotti (2010) also places the FL at the centre of '...agriculture, environment and ecology; social development and equity'. An interesting finding was the 'food justice' sub-theme which referred to FL as an empowering tool for people to access their human right to healthy food, since 'everyone has to eat'. To the author's knowledge, none of the definitions and inquiries into the FL's competencies reflected this component previously.

Shared Responsibility implies the idea that FL should take in account not only the 'moral consequences' resulted from stakeholders' food attitude, behaviours and interests but also the 'wider impact' of their food actions on the environment. Sumner (2015) and the recent work of Slater and colleagues (2018) also recognized the multidimensional influence between FL and the social, cultural, political, economic environment.

Taken collectively, this study revealed similar components and competencies as previous inquiries into the FL concept, with a few variations. The new findings referred to: 'cultural

knowledge' understood as the competency to acquire FL through culture-based food education and through recognition, protection and respect for other food cultures; one's pyramidal 'motivation' in acquiring FL, ranging from food perceived as a biological need to FL as one's self-actualization (a sense of personal fulfilment); and lastly, FL perceived as a fundamental right which may facilitate 'food justice' and social equality.

In light of the components and competencies revealed by the thematic analysis of UK health and nutrition professionals' views, FL may be defined as: **'an empowering tool designed to equip people with a set of applied educational skills and behaviours required to facilitate health enhancing and equitable food relationships; a platform for shared duty and responsibility to engage in ethical food practices that account for moral and physical mutual impact at an individual, community, food systems and the wider environment level'**.

4.2 Key determinants: Challenges & Opportunities

Agency (Personal Capabilities) & Structure (System's Capabilities)

A secondary aim of this paper was to identify the key determinants of FL and, for this purpose, a structure-agency approach was employed to assess the barriers and opportunities impacting on FL: **Agency** - one's educational level characterised by 'knowledge', 'personal skills' and food choices made in the light of own 'lifestyle' and 'cultural behaviour'; **Structure** – 'Environment' (Food systems, Politico-Economic, Socio-Cultural, Food Equity and Equality) and 'Capacity Development' (Food in Action, Food Education, Partnerships). While some recognition was given to the challenges and opportunities experienced at a personal level, it was felt that the wider determinants presented by the System had an accentuated influence on one's FL. As such, the prevailing discourse was about the Structure's duty, and responsibility to unlock the potential of personal skills to enable an FL education environment.

Participants' speech revolved around both the challenges perceived as barriers for FL education but also around practical solutions, recommendations for how the Structure should behave to support the Agency's desires and capabilities regarding food and food practices. Given that FL is still an emerging concept, very few research works were concerned with identifying the key determinants that may impact on FL. To the author's knowledge, only two very recent studies explored the factors influencing FL. Ronto (2017) examined the environmental factors impacting on FL in Australia from the perspective of adolescents and some of the identified enablers/barriers were consistent with the findings of this study. Some examples were: the physical environment (referred to 'food systems' in the present study), politico-economic and socio-cultural factors; the lack of teaching materials, facilities were reflected in this study under the Capacity Development domain ('food education' and 'food in action'). A distinct finding in this study was the lack of 'food equity and equality' perceived as a barrier to people's rights to healthy and ethical foods. The participants suggested that, this may be overcome by creating food justice through tackling food poverty more efficiently and create equal opportunities for everyone to access health enhancing and sufficient food. The second study which explored the adolescents' challenges to acquire FL was conducted by Colatruglio & Slater (2018) in Canada. They also found that 'food learning experiences' (referred to Education through 'knowledge' and 'food skills' in the present study), food meal habits and complex relationships ('lifestyle and cultural behaviour') were perceived as both enablers or barriers in acquiring FL.

Overall, the participants perceived the FL determinants as a shared duty and invited to collaborative actions which should strengthen the Agency's initiatives to acquire FL, but at the same time, the Agency should behave in a responsible manner which isn't self-inflicted or obstructs the Structure's enabling initiatives. An opportunity for this positive, successful

collaboration between Agency and Structure with the end goal to achieve FL and, as such, enable a healthy, ethical food environment may be through the novel movement of 'food citizenship' which has taken hold in the UK. This entails moving away from being the 'passive consumer' to being 'food citizen' by influencing the way the food is produced, grown and distributed (Food Ethics Council, 2018). This may be the key to a fair, sustainable and resilient food system and may open the path towards an FL education enabling environment.

4.3 Strengths and Limitations:

The main strength of this research was that it was the first study to explore the FL concept in the UK context. The enthusiasm of the participants in this study and their limited expertise with FL at an explicit level has enabled for novel, genuine understanding of the concept, 'attributed' to the UK food environment. The participants' interest to contribute to future research work on the FL concept reflects, not only a gap in the UK studies concerned with food education, but also an opportunity for future projects on this topic.

There were also several limitations worth mentioning. One limitation was the time constraint - the majority of the participants felt that the topic of FL was too complex to be discussed in the allocated time. However, this timeframe was set taking into consideration the need of participants to schedule these meetings in their busy professional lives and the risks of low participation having to attend a more-time consuming session. Another limitation was the range of professional expertise of the participants. While there was a well-distributed sample ranging from academics, food experts, nutritionists and public health consultants, the study may have also benefitted from the views of professionals working in the food industry, manufacturing, agriculture and farming. However, this limitation could not be avoided as this study used a snowballing sampling strategy and participants were recruited mainly via nominations. The outcome of the WC meetings is highly influenced by the expertise of the

researcher/moderator and it also depends on the role of the table hosts of briefing the participants/taking notes, therefore the research method used in this study can be considered both a strength or limitation.

The author of this study declared no conflicts of interest.

5. Conclusion

This was the first exploratory research study concerned with identifying the FL defining components and key determinants as perceived by health and nutrition professionals in the UK context. The findings were structured into a wide, complex conceptual framework which incorporated components and competencies ranging from the basic food education and practical food skills, to food behaviours, food resources and food ethics. Novel components of the FL concept as understood in the UK context were: FL acquired through 'cultural knowledge' by respecting, protecting and supporting other food cultures; motivational stages in acquiring FL; 'food justice' as one of the goals of FL. The barriers to acquiring FL may be overcome through an ethical and responsible partnership between the Agency (personal capabilities) and Structure (system capabilities).

This study has implications both in practice and theoretical research on FL. It provides a conceptual framework which can be used as a starting point for further theoretical research into the FL education and, at the same time, the competencies revealed in this study may help practitioners to use the FL explicitly in their food behaviour change interventions.

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***Faculty of Medicine, Dentistry and Life Sciences
Research Ethics Committee***

Standard conditions of approval

Further communications with the Faculty Research Ethics Committee

- 1.1 Further communications during the research with the Faculty Research Ethics Committee (hereafter referred to in this document as “the Committee”) are the personal responsibility of the Lead Researcher (the Applicant).

Commencement of the research

- 2.1 It is assumed that the research will commence within 12 months of the date of the favourable ethical opinion.
- 2.2 Should the research not commence within 12 months, the Lead Researcher should give a written explanation for the delay. It is open to the Committee to allow a further period of 12 months within which the research must commence.
- 2.3 Should the research not commence within 24 months, the favourable opinion will be suspended and the application would need to be re-submitted for ethical review.

Duration of ethical approval

- 3.1 The favourable ethical opinion for the research applies for the expected duration of the research as specified in the application form. If it is proposed to extend the duration of the study, this should be submitted for approval as a substantial amendment.

Progress reports

- 4.1 The Lead Researcher should submit a progress report to the Committee 12 months after the date on which the favourable opinion was given. Annual progress reports should be submitted thereafter.

Amendments

- 5.1 If it is proposed to make a substantial amendment to the research, the Lead Researcher should submit a notice of amendment to the Committee.

5.2 A substantial amendment is any amendment to the terms of the application for ethical review, or to the protocol or other supporting documentation approved by the Committee, which is likely to affect to a significant degree:

- a. the safety or physical or mental integrity of the participants;
- b. the scientific value of the research;
- c. the conduct or management of the research.

5.3 Notices of amendment should be personally signed by the Lead Researcher.

5.4 A substantial amendment should not be implemented until a favourable ethical opinion has been given by the Committee, unless the changes to the research are urgent safety measures (see section 6). The Committee is required to give an opinion within 15 working days of the date of receiving a valid notice of amendment.

REC Standard Conditions of approval

1

5.5 Amendments that are not substantial amendments (“minor amendments”) may be made at any time and do not need to be notified to the Committee.

Urgent safety measures

6.1 The Lead Applicant may take appropriate urgent safety measures in order to protect research participants against any immediate hazard to their health and safety.

6.2 The Committee must be notified within three days that such measures have been taken, the reasons why and the plan for further action.

Serious Adverse Events

7.1 Any Serious Adverse Event (SAE) occurring to a research participant must be promptly notified to the Committee where it is considered possible that the event resulted from their participation in the research.

An SAE is an untoward occurrence that:

- a. results in death;
- b. is life-threatening;
- c. requires hospitalisation or prolongation of existing hospitalisation;
- d. results in persistent or significant disability or incapacity;
- e. is otherwise considered significant by the investigator.

7.2 Reports of SAEs should be provided to the Committee within 15 days of the Lead Researcher becoming aware of the event.

7.3 The Lead Researcher may be requested to attend a meeting of the Committee or Sub-Committee to discuss any concerns about the health or safety of research participants.

Conclusion or early termination of the research

8.1 The Lead Researcher should notify the Committee in writing that the research has ended within 90 days of its conclusion. The conclusion of the research is defined as the final date or event specified in the protocol, not the completion of data analysis or publication of the results.

8.2 If the research is terminated early, the Lead Applicant should notify the Committee within 15 working days of the date of termination. An explanation of the reasons for early termination should be given.

Final report

9.1 A copy of the abstract/ executive summary of the thesis/ dissertation/ report should be sent to the FREC Secretary within 6 months of the conclusion of the study.

Review of ethical opinion

10.1 The Committee may review its opinion at any time in the light of any relevant information it receives.

10.2 The Lead Researcher may at any time request that the Committee reviews its opinion, or seek advice from the Committee on any ethical issue relating to the research.

Breach of approval conditions

11.1 Failure to comply with these conditions may lead to suspension or termination of the favourable ethical opinion by the Committee

General Risk Assessment Pro-forma

Assessment Undertaken By		Mariana Simon			
Department / Location		Clinical Sciences and Nutrition – University of Chester			
Signed			Date	06/06/2018	
Hazards identified		Risk of or from & who is at risk	Control measures already in place	Further Actions Required	Review Date
Breaching the confidentiality rules during the data collection (World Café meetings)	All participants	The lead researcher will inform the participants about the confidentiality rules during the meeting - the names of the participants should not be noted down on any paper material used for data collection		The lead researcher will make sure the names of the participants will not be written down/will be deleted from the paper materials. Names of the participants will not appear on the transcripts and confidentiality of the participants will be guaranteed in the final report	06/06/2018
Lunch supplied	For participants with food allergies/intolerances	Any participants with allergies. Participants will be asked if they have special dietary requirements and these will be catered for.		Nil	06/06/2018



University of
Chester



Title of Project:

**Food Literacy: Insights from UK Nutrition and Health Professionals
on an Emerging Concept**

Name of Researcher: **Mariana Simon**

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.

Please initial box

2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.

3. I understand that my name and personal details will not appear in any report.

4. I understand that anonymised data will be published.

5. I agree to take part in the above study.

Name of Participant

Date

Signature

Researcher

Date

Signature

(1 for participant; 1 for researcher)



World Café Meeting Registration Form

[Venue, Date]

Proposed Meeting Topic:

Food Literacy: Insights from UK Nutrition and Health Experts on an Emerging Concept

Moderator: Mariana Simon

Please complete and submit form to: 1718049@chester.ac.uk by [Date]

Name of the Participant	
Job Title	
Other Potential Participants you wish to nominate	

Lunch, snacks and refreshments will be provided*.

*Please give details of any dietary requirements:

Appendix 5 – [Email invitation]

Subject: Come along for a coffee talk

Dear Title & Name

As a Food & Nutrition Specialist/Health professional/Exercise Scientist I would like to invite you to a group meeting to discuss the topic of 'food literacy'.

In the recent years, it has been theorized that increasing people's education about food may improve their dietary habits, health and wellbeing. As such, the concept of 'food literacy' has been employed in many dietary interventions and behaviour change practices. This emerging concept has not yet been explored, understood or conceptualized in the UK context. Therefore, as part of my MSc Dissertation Project, I am organizing a World Café meeting with professionals in the field to explore the concept of 'food literacy' and its key determinants in the UK context. The insights generated from the group discussion will contribute to the contemporary literature by enriching the existing definition and the range of factors that may impact on food literacy. By participating in this study, you also have the opportunity to contribute to a wider research agenda, which aims to influence the public policy and, ultimately, to improve people's health.

The World Café meeting (one of two across the UK) will be held on [Date, Time & Location]. Lunch, snacks and refreshments will be provided.

If you are interested in attending, please complete the Registration form attached and email this to 1718049@chester.ac.uk. Should you be unable to attend, but wish to contribute, you have the option to delegate a person who can replace you. Please also nominate other potential participants which you think may be interested in receiving an invitation to one of the two World café meeting.

In anticipation of your interest in this research work, I have also attached the Participant Information sheet and Consent form for you to sign and return on the day of the meeting.

Thank you and regards,

Mariana Simon

1718049@chester.ac.uk

CAFÉ MENU

Food Literacy: Insights from UK Nutrition and Health Professionals on an Emerging Concept

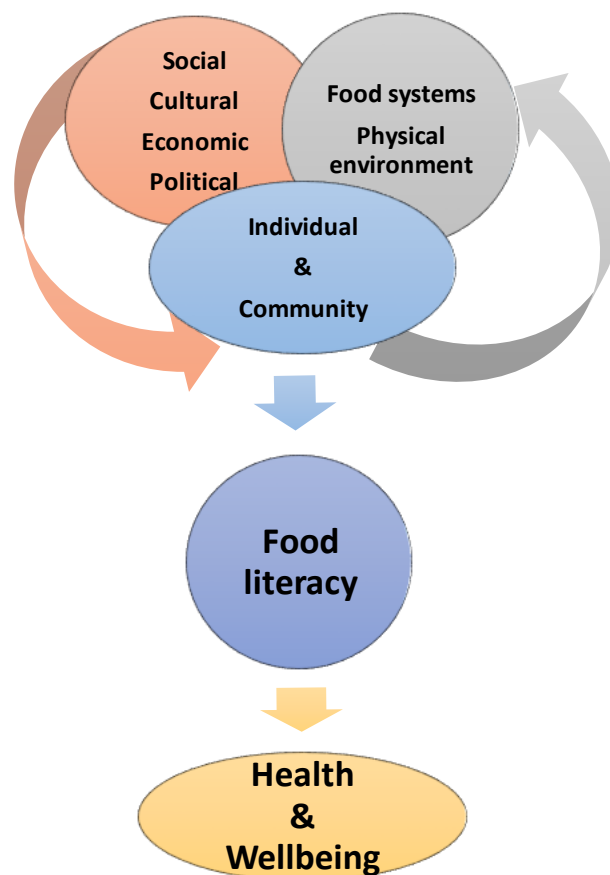


Figure 1. Proposed Working Framework¹

1. Based on work by Vidgen & Gallegos, 2014; Cullen et al., 2015; Perry et al., 2017.

1. Q. What do you understand by the term of ‘food literacy’?

This may include factors that led to enhancing your education with regards to food, either through your personal experience or professional practice. (10 min)

2. The proposed ‘working framework’ has been inspired from the existing literature describing different contexts influencing one’s ‘food literacy’ (Vidgen & Gallegos, 2014; Cullen et al., 2015; Perry et al., 2017).

Q. With reference to the proposed ‘working framework’ what do you think are the challenges & opportunities that may impact on ‘food literacy’ within the UK context? These may refer to differences in socio-cultural food beliefs; affordability, accessibility and food availability in the current economic-political environment; current food production and distribution practices; the role of current agriculture practices and future potential ecological resources for food; personal competencies and collective actions aimed at developing eco-friendly and healthy diets. (20 min)

3. It has been argued that ‘...food literacy is built on a positive relationship with food...’ and that it may enhance one’s health and wellbeing (Cullen et al., 2015).

Q. Thinking about the challenges and opportunities revealed in Q2, how can people in the UK build a positive relationship with food to better support their health and wellbeing? This may include potential solutions to enhance one’s personal skills, knowledge and behaviours to identify, understand and use food-related information, practices and experiences with the aim to support and maintain a positive health and wellbeing status.