Norwegian University of Life Sciences

Master's Thesis 2021 30 ECTS
Faculty of Landscape and Society

Navigating Narratives toward the Health-Sustainability Nexus: Oslo's prescriptions for healthy and sustainable diets

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Declaration

I, Elaina Weber, declare that this thesis is a result of my research investigations and findings. Sources of information other than my own have been acknowledged and a reference list has been appended. This work has not been previously submitted to any other university for award of any type of academic degree.

Signature: 

Date: March 15, 2021

Photo 1
(see Appendix 7)

"We need to create a new system that makes it easier for us to navigate [toward] better choices when we go into our grocery shop."

– Intern at the EAT Foundation, interview
(see Appendix 5)

Acknowledgments

I would like to recognize:

The multi-disciplinary students I assist as a Writing Advisor, who keep my skills sharp and my gaze lifted to the world outside of my own thesis;

My coworkers at NMBU's Learning and Writing Centres, who help me build my writing and thinking skills, keep me inspired, and give me a sense of purpose;

My advisor, John Andrew, and my educators, who help me stand on the shoulders of giants;

Each person who kindly allowed me to interview them, who chatted with me in conferences, and who pointed me to valuable resources;

Vibeke, who translated my texts professionally while treating me personally;

The teams behind NVivo, Citavi, Transcribe, Adobe Illustrator, and MindMeister, the invaluable tools that enabled my expanded understanding;

My partner, Dorian, for patiently coaching me as I floundered with these newfangled technologies, for being my virtual coworker, and for listening;

My housemates, Anne-Marie, Jostein, and Jonas, for the hugs, music, and laughter, and for ensuring I always made time for good food;

My family, who supports my endeavors, no matter how far away they take me, especially Mara, who helped with copy editing;

My friends, especially Pam, April, Victoria, Anne-Marie, Jostein, Elle, and Sydney, for making copy editing fun;

My academic mentor and friend, Victoria, who patiently roamed among the trees with me until I could see the forest again; and

The Vardåsen forest, which sheltered my long walks on which many of these ideas were conceived.

Thank you.

Table of Contents

List of Figures

List of Tables

Abbreviations

CSA	Community Supported Agriculture
FAO	Food and Agriculture Organization (of the United Nations)
FBDG	Food-based dietary guideline
IPCC	Intergovernmental Panel on Climate Change
NCD	Noncommunicable disease
NCM	Nordic Council of Ministers
NCN	National Council for Nutrition (*Nasjonalt råd for ernæring*)
NDH	Norwegian Directorate of Health (*Helsedirektoratet*)
NGO	Non-governmental organization
NIPH	Norwegian Institute of Public Health (*Folkehelseinstituttet*)
NNR	Nordic Nutrition Recommendations
NSD	Norwegian Center for Research Data (*Norsk senter for forskningsdata*)
SDGs	Sustainable Development Goals
UN	United Nations
WHO	World Health Organization

Abstract

Unhealthy diets are the leading risk factor for deaths worldwide, and food systems pressure Earth system processes past their planetary boundaries. Research calls for transformational change toward healthy and sustainable diets. Yet, messages in Oslo's foodscape dissonantly prescribe diets for health and sustainability. From the perspectives of social practice theory, discourse analysis, and transformational change, messages matter: they can affect meanings around food and, indirectly, dietary practices.

This thesis asks, "What prescriptions and claims for healthy and sustainable diets are purported in Oslo's foodscape, and what concepts and sources are they based on?" Actor mapping, interviews, and discourse analysis revealed actors and their messages, sources, and underlying concepts. The messages direct a change in dietary practices on six levels, and their sources range in proximity to scientific theorizing. The actors' concepts of health and sustainability were conflated, narrow, and obscured. This confusion manifested in binary framing of a complex problem, which restricted discussion of tradeoffs and synergies within and between the dimensions of health and sustainability. In response, I explore a framework for the health-sustainability nexus that accommodates a diverse discourse, creating space for productive discussion.

The Nordic Nutrition Recommendations (NNR) are the basis for Nordic food-based dietary guidelines (FBDGs). The next edition aims to include sustainability in the analysis. To direct their next update, I suggest that the NNR Committee use a framework for the health-sustainability nexus, like the one explored here, alongside concepts of transformational change. As public messages, the resulting FBDGs could more clearly direct diets toward health and sustainability in the Nordics, including Oslo.

1. Introduction

Advertisements entice Oslo residents as they move through a landscape of restaurants, grocery stores, and food stands. The messages promise food that is tasty, novel, affordable – and, increasingly, healthy and sustainable. On magazine racks, articles call for eating organic, plant-based, and local foods. Simultaneously, scientists develop aspects of lab-grown meat in Norway (Nofima, 2020), and researchers give public lectures on future foods (Future Foods, 2020). For sourcing healthy and sustainable diets, there are many dimensions to consider.

Comparing these dimensions can be confusing. Should one eat Norwegian beef to support local farmers or legumes flown in from abroad? Perhaps the cows grazed on organic pastures while the soy was grown with pesticides where a forest was cleared for fields. Is limiting beef consumption in favor of processed plant-based burgers healthier? How can one weigh governmental recommendations for a healthy diet against non-governmental organizations' recommendations for a sustainable diet? These factors could confound any concerned Oslo resident.

This thesis investigates the narratives of healthy and sustainable diets in Oslo's foodscape. Through actor mapping, interviews, and discourse analysis, this thesis analyzes public messages that reach Oslo residents in their food environments. These messages call for changes in dietary practices. By tracing the concepts underlying the messages, my application of discourse analysis reveals ambiguous yet narrow concepts of health and sustainability.

These concepts were further obscured, conflated, flattened, and otherwise confused in the discourse and supporting literature. The result is a constricted space for discourse searching for singular solutions, which fails to accommodate discussions on synergies and tradeoffs.

In response, I explore a framework for the health-sustainability nexus that accommodates diverse narratives. The framework expands the space for discourse, which offers an opportunity to compare diverse factors, discuss synergies and tradeoffs, and facilitate collaboration. I suggest that future dietary guidelines from the Nordics could aim toward this framework. With an expanded space for dialogue, one might better navigate narratives surrounding sustainable and healthy dietary practices.

2. Research Questions and Terms

This chapter introduces the research objectives and questions. Then it defines terms within the objectives and questions.

2.1 Research objectives and questions

This thesis explores public messages for healthy and sustainable diets in Oslo's foodscapes. The study objectives are to (1) map actors asserting messages; (2) identify their messages and the practices they call for; (3) assess the sources actors refer to in their messages; and (4) analyze the concepts behind these messages.

The main research question asks, "What prescriptions and claims for healthy and sustainable diets are purported in Oslo's foodscape, and what concepts and sources are they based on?" Following this question are four sub-research questions:

1. What actors put forward messages about healthy and sustainable diets in Oslo's foodscape?
2. What do actors' messages say, and what types of dietary practices do they motivate?
3. With what references or sources do actors support their messages?
4. What concepts underly actors' messages?

2.2 Terms

In this context, “foodscapes” are food landscapes, where people encounter food, food messaging, and elements of the food system (Mikkelsen, 2011). In turn, the “food system” includes all the processes, institutions, people, environment, infrastructure, inputs, and outputs involved in the food’s life cycle (Mikkelsen, 2011). The food’s “life cycle” includes growing, harvesting, processing, packaging, distributing, retailing, preparing, consuming, recycling, and discarding food (Willett et al., 2019). In the foodscape, “public” messages are accessible by an average Oslo resident concerned with healthy and sustainable diets. This excludes academic publications. Instead, my research focuses on messages which a resident could freely interact with in the public sphere.

The messages of interest encourage healthy and sustainable diets. “Diet” refers to the average food intake over a period of weeks, months, years, or a lifetime, not individual food choices. “Messages” consist of prescriptions and claims. The term “prescription” refers to commands or purported guidelines for what one should eat that call for change in action (Plessz et al., 2016). “Claims” use softer language, simply stating what practices would be best for health and sustainability. Both prescriptions and claims motivate a shift in behavior.

“Concepts,” on the other hand, are not usually directional, but descriptive. Instead of inspiring action, they show an actor’s understanding of health or sustainability. In their messages, actors sometimes accredit other “sources,” either formally through citations or informally by allusion. Together, sources and concepts illuminate actors’ frameworks for understanding healthy and sustainable diets.

3. Background and Framework

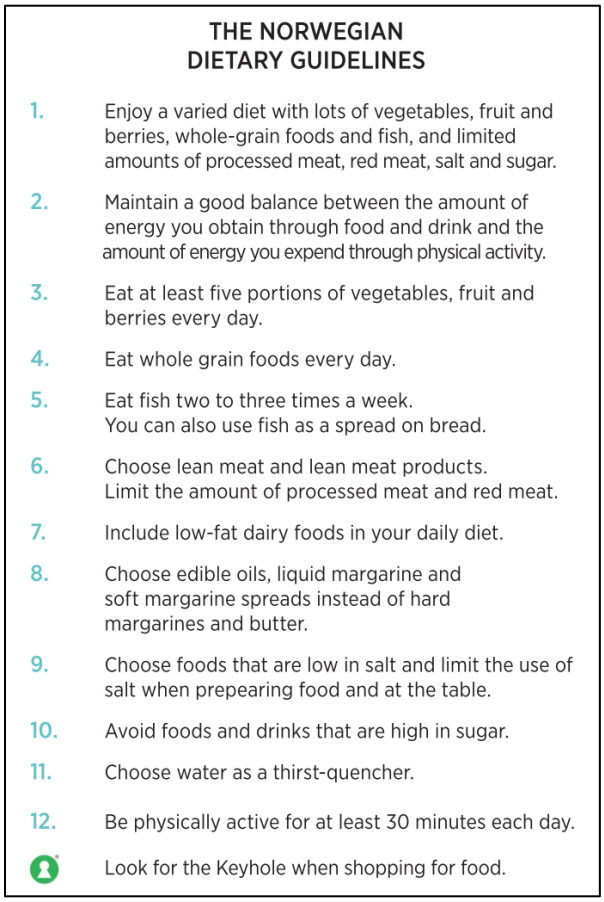
This chapter sets the stage for this thesis. It weaves background information through the conceptual and theoretical framework. It concludes with epistemology and ontology.

3.1 Food-based dietary guidelines

Perhaps a concerned individual looking for trustworthy guidance on what to eat would turn to their national food-based dietary guidelines (FBDGs). In Norway, the most current FBDGs were published by the Norwegian Directorate of Health (NDH, *Helsedirektoratet*) in 2014 (FAO, 2021). Unlike most countries (Herforth et al., 2019), Norway does not use a graphic representation of FBDGs to convey a sense of variety and proportion, like a pyramid or plate (FAO, 2021). Instead, it consists of a list of 12 main messages (see Figure 1a) (Norwegian Directorate of Health, 2014). Sub-messages follow with detailed qualifiers. Its summary consists of directional messages like “choose more vegetables, fruit and berries” and “choose less red meat” (Norwegian Directorate of Health, 2014). Like other countries’ FBDGs (FAO, 2021), Norway’s contain advice about foods with fat, protein, fiber, salt, and sugar, as well as consuming enough fluids, fruits, and vegetables while moderating body weight and alcohol intake.

At the end of the guidelines, a small paragraph connects healthy eating to greenhouse gas emissions, a proxy for environmental sustainability (see Figure 1b). The guidelines mention that plant-based diets and avoiding food waste can shift one's diet toward sustainability. Upon reading these messages, one might naturally wonder how and by whom they were developed.

a



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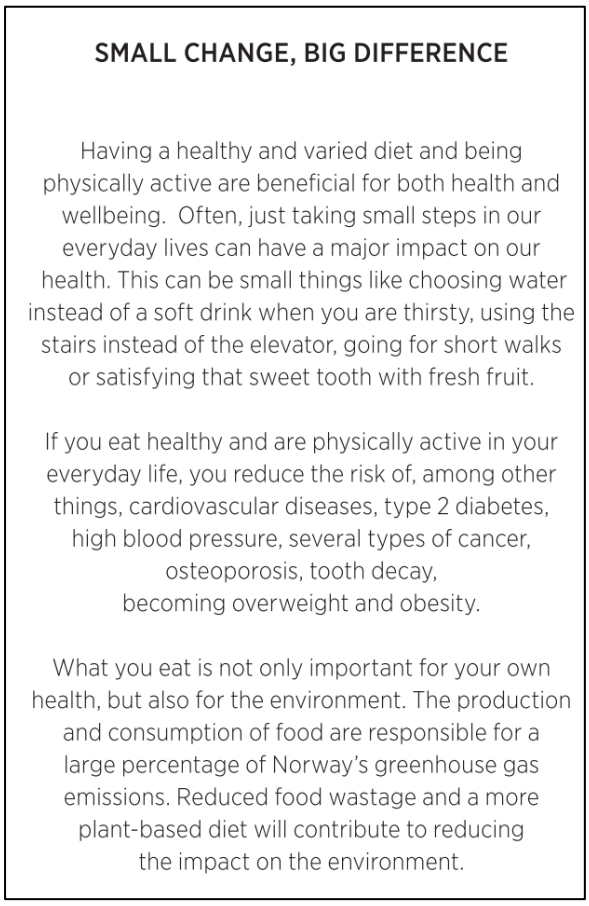

Figure 1 The current version of the Norwegian Dietary Guidelines. Figures show main messages (1a) and notes on environmental sustainability (1b, final paragraph). Figures from Norwegian Directorate of Health (2014).

Traditionally, FBDGs are based on nutrition alone, though sustainability has recently edged into the analysis. Generally, FBDGs translate nutritional recommendations from units of macro- and micronutrient consumption into practical messages about foods, meals, and diets (Mason & Lang, 2017, p. 90). FBDGs stem from dietary reference values, which are

complete sets of nutrient minimums and maximums for preventing disease, either by a disease's direct association to micronutrient deficiency or by reducing the risk of chronic disease (Mason & Lang, 2017, pp. 89–90). Countries adapt the dietary reference values to their local context, often following guidelines from the Food and Agricultural Organization (FAO) of the United Nations (UN) (FAO, 1998; FAO & WHO, 2006) or regional guidelines, such as those for the European Union (Sandström, 2001). None of the guidelines for formulating FBDGs systematically incorporate sustainability. In 2016, a global review isolated only four official governmental FBDGs that include sustainability (Fischer & Garnett, 2016). A few more recently emerged (FAO, 2021), yet out of over 100 UN-recognized countries with national FBDGs (FAO, 2021), very few include sustainability.

The Norwegian Dietary Guidelines are based on international collaboration and a scientific literature review. This review, the Nordic Nutrition Recommendations (NNR), was last updated in 2012. NNR 2012 takes a more holistic approach than previous editions, shifting the focus from individual nutrients to overall dietary patterns based on food groups (Nordic Council of Ministers, 2014). Further, a chapter of the NNR 2012 discusses sustainability and environmental issues. However, this chapter is "more exploratory" than comprehensive as its literature review has "not been systematic" (Nordic Council of Ministers, 2014, p. 137). They focus mostly on environmental sustainability, specifically climate change, citing insufficient research toward frameworks for other issues (Nordic Council of Ministers, 2014, p. 137). The lack of a holistic framework inhibits their ability to consider multiple dimensions of sustainability and health in their analysis.

FBDGs aim to guide the food practices of the general population (Mason & Lang, 2017, p. 90). They also direct the food industry and national policies on nutrition and food (Mason & Lang, 2017, p. 90). However, Oslo residents may more regularly come into contact with messages from grocery stores, restaurants, newspapers, magazines, and other actors.

FBDGs contribute to a larger discourse of confounding public messages about healthy and sustainable diets in Oslo, which this study explores.

3.2 Why messages matter: Social practice theory and discourse analysis

Public messages matter because, to some degree, they direct social practices. Social practice theory recognizes that people's lifestyles are not simply personal choice, nor are their behaviors a simple effect of external structures or technologies baring down on them (Shove et al., 2012, pp. 2–3). Instead, a person's practices – like choosing, preparing, and eating foods – are constantly shaped by the elements their practices are made up of (Shove et al., 2012, p. 22). In other words, behaviors are not born out of a struggle between structure and agency, but social practices ordered across space and time (Giddens, 1984, p. 2). The conversation revolves not around power and subjection, but around elements that constitute practices. In this way, social practice theory holds space for a complex nexus around human behavior. Each year, day, and moment, individual actors reproduce the structural features of their social system, like the farms, stores, cooking styles, and cultural meanings linked to individual meals (Shove et al., 2012, p. 4). These social systems, in turn, recruit individuals as carriers of practices (Shove et al., 2012, p. 4). Practices flow through people, and a practice requires constant reproduction to last.

For a practice to be reproduced, its elements must be maintained and operated. Accounts of social practice theory vary in how they delineate elements of practices, but one accessible account describes three: materials, competences, and meanings (Shove et al., 2012). Materials are simply physical entities and the matter they are made from, like a bag of flour, a bowl, and an oven. To use these materials in the practice of baking bread, a person needs certain "skills, know-how, and technique" (Shove et al., 2012, p. 14), or competences.

They must know, or be able to find, the ratio of flour to water, yeast, and salt. They need practiced hands for kneading and a feeling for the temperature at which dough rises best. Of course, many leave the bread making to industrial bakers, but a person who bakes their daily bread may find meaning in this practice.

Meanings are nebulously defined across social practice theory. Shove et al. (2012, pp. 23–24) aggregate into "meanings" what other social practice theorists describe as mental activities, emotions, motivational knowledge, purposes, and beliefs. Most basically, meanings include associations and classifications (Shove et al., 2012, p. 53) used to make sense of, or understand, the world.

Discourse analysis presumes that people understand reality by constructing a discourse around it, or that language forms social reality (Jørgenson & Phillips, 2002). A key assumption of this method is that texts cause change (Fairclough, 2003, p. 8). Texts use meaning-making as a middle-man to change people, actions, ideologies, social relations, and the material world. In other words, texts affect practitioners and their practices, including their meanings, competencies, and materials. In this context, the change is not of regular, cause-effect relationships, but rather loose, broad, irregular, and nonlinear relationships (Fairclough, 2003, pp. 8–9).

People combine meanings with materials and competences into practices through their actions (Shove et al., 2012, p. 6). Over time, they create routinized blocks of individual behaviors (Shove et al., 2012, p. 6), like all of the small steps of baking a daily bread. The elements used in these practices persist, as long as they are maintained and used.

However, if meanings go unused, they may be discarded (Shove et al., 2012, pp. 54–56). This can be clearly imagined with other elements, especially materials; picture the countless bread machines purchased in the 1990s biding their time in second-hand shops and basements. This is also true for meanings (Shove et al., 2012, pp. 54–56). For example, in the United Kingdom, allotment gardens once associated with producing calories for the hungry

are now associated with social hobbies (Acton, 2011). Perhaps there are meanings around healthy and sustainable diets that we should discard, or some that have been discarded that may be worth reviving. Alternatively, perhaps new meanings should be created.

Social structures define what is possible in a realm of society (Fairclough, 2003, pp. 23–25). Within these possibilities, events are the set of actions that actually occur. Social practices mediate between social structures and events, controlling which events are selected and retained over time (Fairclough, 2003, pp. 23–25). Practices emerge, change, and fade away in part due to changes in meaning (Shove et al., 2012, p. 21).

In this study, public messages for healthy and sustainable diets are one element of dietary practices in Oslo. Because shifts in these messages, and in meaning, can affect a shift in practices, the concepts underlying these messages matter. So, when asking what messages actors purport about healthy and sustainable diets, one must first ask: what is health?

3.3 What is health, and how do diets relate?

The word “health” originates from the Old English “hælth,” meaning “whole,” or that which is “complete in itself” (Brüssow, 2013). Although no clear consensus emerges on the components of health, most agree that health is multidimensional (Hjelm, 2010, p. 4). Most models of health include five dimensions: physical, emotional, social, intellectual, and spiritual (Hjelm, 2010, pp. 4–5). Additional dimensions often proposed, and especially relevant to this thesis, are economic and environmental health (Park, 2015, pp. 15–16). These dimensions overlap and support each other (Hjelm, 2010, p. 4).

The physical dimension conceptualizes health biologically, focusing on normal functioning of the organs and tissues with a lack of disease and impairment (Park, 2015, p. 14). Emotional and intellectual health split into two dimensions that which is commonly

known as “mental” health. Park (2015, p. 15) defines mental health as the “ability to respond to the many dimensions of life with flexibility,” “a sense of purpose,” and freedom from internal conflicts. The emotional dimension of mental health refers to healthily responding to one’s feelings, while the intellectual dimension refers to harmony in cognition (Park, 2015, p. 15).

The social dimension focuses on “harmony and integration” of the individual, their community, and “the world in which they live” (Park, 2015, p. 15). It involves the ability to see oneself as “a member of a larger society” (Park, 2015, p. 15). Social health is rooted in a “positive material environment,” which refers to sustainable economic inflow and outflow, but also one’s environmental health (Park, 2015, p. 15). Environmental health refers to all things outside of the human organism, but focuses on climate, water, air, and basic provisioning, like housing and food (Park, 2015, pp. 15–19).

With a “favorable” environment, the individual can “make full use of his physical and mental capabilities” (Park, 2015, p. 9). This enables spiritual health, which refers to striving for purpose and finding meaning in life. It includes feeling connected to others, the planet, and “the intangible something that transcends physiology and psychology” (Park, 2015, p. 9).

This thesis considers seven dimensions of health: physical, emotional, intellectual, social, economic, environmental, and spiritual. Breaking health down into dimensions facilitates understanding (Hjelm, 2010, p. 4). However, all dimensions interact and overlap into a whole person.

3.3.1 Defining health

In 1948, the World Health Organization (WHO) formulated a definition of health that was revolutionary for its time. In their definition, “health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (WHO, 2006). Previous conceptions of health focused on the absence of physical disease and omitted

social and mental health. This edition resisted defining health by a lack of its opposite, disease, and instead defined health by what it is, a state of wellbeing. Still, the WHO has not updated the definition since its formulation (WHO, 2021), and this definition falls flat in the twenty-first century.

Various proposals for new definitions of health critique the current WHO definition (Huber et al., 2011). Most of these criticisms say that requiring "complete" wellbeing is too absolute (Huber et al., 2011). It contributes to a view of society where most people could be considered unhealthy most of the time, as long as one element of their lived experience is not well. This encourages hyper-medicalization of the human experience, creating illnesses to be cured from conditions not previously framed as a problem (Huber et al., 2011). The definition fit the times when it was formulated, when most diseases were acute and chronic diseases meant early deaths (Huber et al., 2011).

In many contemporary societies, most diseases are chronic (Huber et al., 2011). Improved hygiene, nutrition, and sanitation mitigate acute diseases, and interventions keep those with chronic diseases alive longer (Huber et al., 2011). With the current definition, these people could be considered ill, even if they cope with chronic diseases and report their own good function, fulfillment, and wellbeing. Seeing health as a "state of complete physical, mental, and social wellbeing" fails to capture the dynamic nature of the human experience, which is a flux of highs, lows, and intermediates. Perhaps a more fluid concept could replace this limited definition.

An alternative has been proposed, conceiving of health as "the ability to adapt and to self-manage" (Kromhout & Smid, 2009). In this framing, health is about adapting to one's unique, individual challenges. In the further-developed Meikirch model, people respond to their life demands through biologically given and personally acquired potentials (see Figure 2) (Bircher & Kuruvilla, 2014). One can meet life's demands by increasing their acquired potentials. Alternatively, one can simply decrease their life demands. In this context, health is

the ability to adapt to or mitigate challenges in all dimensions, including physical, emotional, intellectual, social, economic, environmental, and spiritual challenges. The Meikirch model of health leaves space for any resilient individual to live healthily, and the conversation turns from eradicating imperfections to prevention and capacity building.

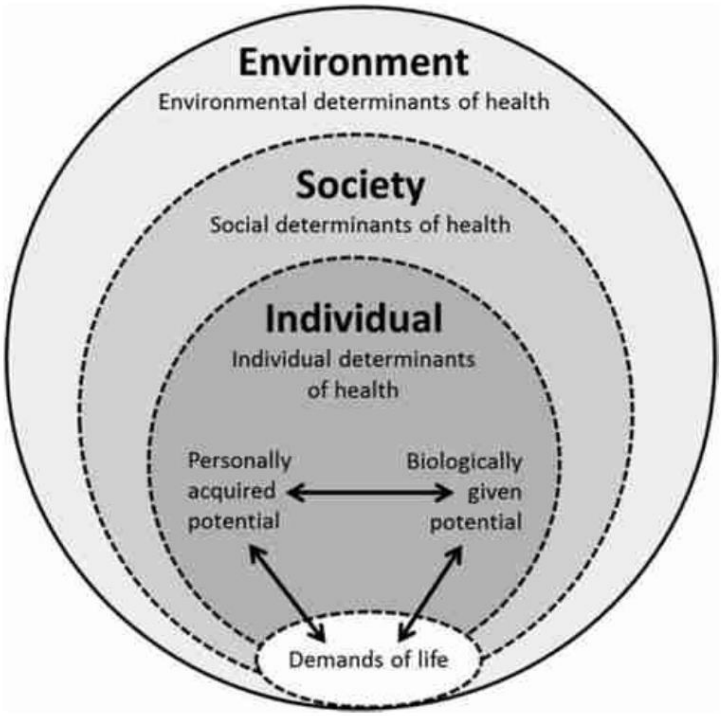

Figure 2 The Meikirch model of health. The model emphasizes using biologically given and personally acquired potentials to manage the demands of life. The ability to adapt and self-manage persists throughout life, and is affected by a person's individual, societal, and environmental determinants of health. Figure from Bircher and Kuruvilla (2014).

3.3.2 Linking health and diets

In many dimensions of health, dietary practices can affect a person's resilience to life demands. However, much of the literature focuses on the threat of unhealthy diets to physical health, especially regarding noncommunicable diseases (NCDs). Admittedly, the link between diets and NCDs is strong. An unhealthy diet is the leading risk factor for deaths worldwide (UN Decade of Action on Nutrition Secretariat, 2016). The mortality and

morbidity risk from unhealthy diets is higher than unsafe sex, alcohol, drug, and tobacco use combined (Willett et al., 2019).

Unhealthy diets contribute to global increases in obesity (Willett et al., 2019). The WHO (2020) reports that worldwide, obesity has nearly tripled since 1975, with 39% of the world's adult population overweight and 13% obese in 2016 (WHO, 2020). Sixty-five percent of the world's population live in countries where being overweight and obese kills more people than being underweight. In 2019, 38 million children under the age of 5 were overweight or obese (WHO, 2020).

Simultaneously, more than 820 million people lack sufficient food (WHO, 2020). Malnourishment (including under-nutrition, over-nutrition, and micronutrient deficiencies) is even more prevalent, contributing to premature death and morbidity (WHO, 2020). In Norway, an unhealthy diet was the highest contributing risk factor for premature deaths in 2013 (Institute for Health Metrics and Evaluation, 2016). The global burden of NCDs associated with unhealthy diets are predicted to worsen as dietary trends continue (Willett et al., 2019).

However, models predict that if, on a global average, people consumed 50% less "unhealthy foods"[1] and doubled their consumption of nuts, fruits, vegetables, and legumes, 10.8 to 11.6 million deaths per year would be averted[2] (Willett et al., 2019). Shifting to healthy diets could improve responses to physical challenges, building physical resistance to NCDs (Willett et al., 2019). Still, to better understand the benefits of a healthy diet, one should consider its effects on the remaining dimensions of health.

Considering health as an ability to adapt to challenges, including environmental, social, and economic challenges, overlaps and synergies occur between concepts of health

[1] Including red meat and sugar (Willet et al., 2019)
[2] A 19.0 to 23.6% reduction (Willet et al., 2019)

and sustainability. To explore these overlaps, one must first explore the concept of sustainability.

3.4 What is sustainability, and how do diets relate?

At its core, sustainability is the capacity to be maintained without "interruption or weakening," or the ability to last for a prolonged period (Merriam-Webster, n.d.). Like a healthy person, a sustainable system is resilient and self-managing (Folke et al., 2016). Since the 1980s, sustainability has been ascribed three parts: environmental, social, and economic (Purvis et al., 2019). In some circles, concepts of sustainability are shifting away from framing "the environment" as an externality, focusing instead on human societies as a part of a living biosphere (Folke et al., 2016). This shift reframes the three pillars of sustainability (represented as pictorial pillars holding up a roof entitled "sustainability") and three dimensions of sustainability (represented as a triple Venn diagram). Instead, biosphere-based sustainability nests the concepts (see Figure 3).

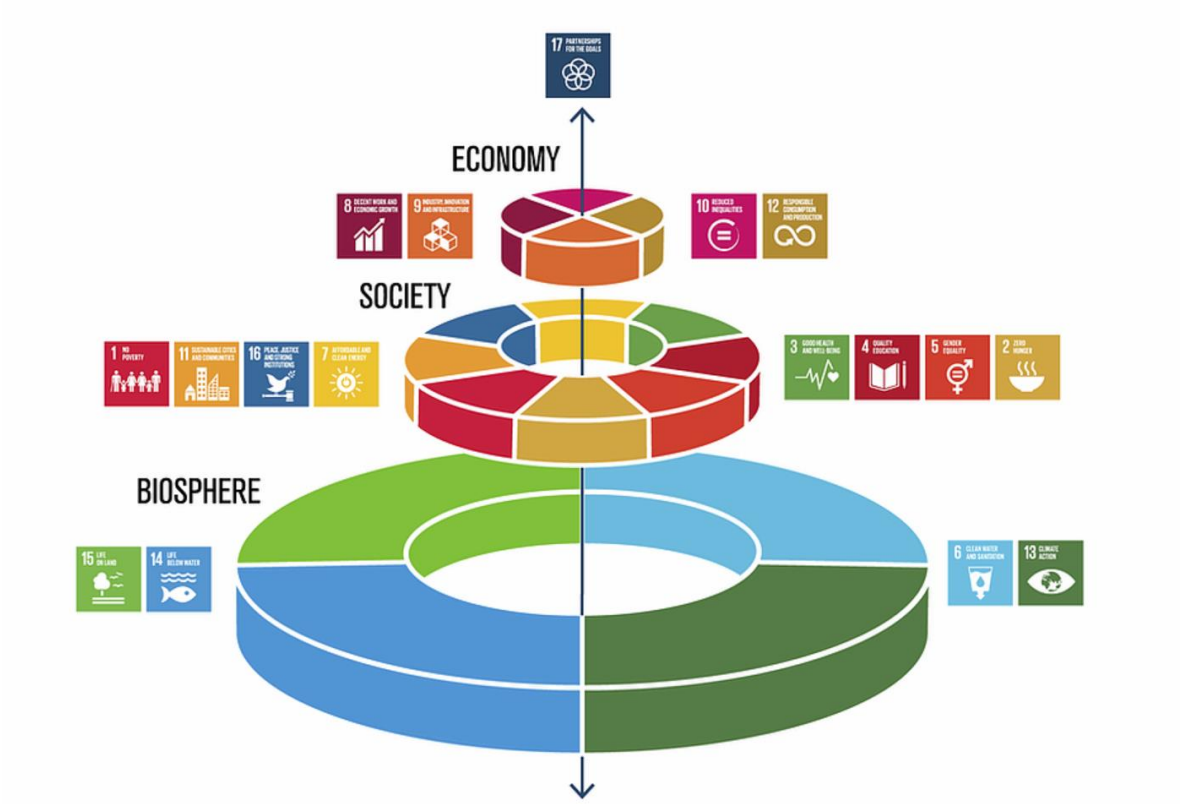

Figure 3 The nested dimensions of biosphere-based sustainability. The dimensions include the biosphere (often referred to as the "environment"), society, and the economy, shown here with associated Sustainable Development Goals' icons. The economy is nested with society, which is nested in the biosphere. Figure from Folke et al. (2016).

Instead of separate entities, dimensions are framed as levels of sustainability. The innermost levels pertain to only humans, and the outermost includes other living and non-living entities. Together, humans and the biosphere they live in make up a socioecological system (Folke et al., 2016). A resilient socioecological system addresses all dimensions of biosphere-based sustainability.

Within the conversation on sustainable diets, a heavy emphasis is placed on environmental sustainability (Béné et al., 2019), which is separated from human dimensions. This framing fails to position humans as intertwined within a socioecological system (Folke et al., 2016). As this thesis sees language as a factor for social change, what is often termed "environmental" sustainability will henceforth be termed biospheric sustainability, except when referring to the discourse of others.

3.4.1 Biospheric sustainability: Planetary boundaries

Various debated models for biospheric sustainability and Earth system limits exist (Lenton et al., 2008; Sayre, 2008; Scheffer et al., 2001; Turner, 2008). Among these, the planetary boundaries framework is independent on assumptions of human needs and potential for innovation (Steffen et al., 2015). Instead, it identifies and quantifies the Earth system processes that regulate the ability of the planet to stay within stable Holocene-like conditions, in which human civilizations can flourish (Steffen et al., 2015).

According to Steffen et al. (2015), there are nine such processes. Three of the nine processes have planetary-scale tipping points, beyond which a single process could push the Earth system into an unstable state. These three processes are the climate system, the ocean system, and the stratospheric ozone layer. They correspond with the planetary boundaries for climate change, ocean acidification, and stratospheric ozone depletion. The other six Earth system processes fundamentally regulate the large-scale processes. They have their own, more localized tipping points that, if aggregated simultaneously, could have planetary-scale effects. Their corresponding planetary boundaries are freshwater use, biogeochemical flows, biodiversity loss, land use change, atmospheric aerosol loading, and introduction of novel entities (Steffen et al., 2015).

For each boundary, Steffen et al. (2015) quantify an inner zone of safe operating below the planetary boundary. The safe zone is followed by a zone of uncertainty, then a zone of high risk. The boundaries for biogeochemical flows of nitrogen and phosphorous and biosphere integrity have already been crossed into the zone of high risk (Steffen et al., 2015). Barring some debate (Gerten et al., 2013; Gerten et al., 2015; Jaramillo & Destouni, 2015), land system change, freshwater use, and climate change boundaries have been pushed into the zone of uncertainty (Steffen et al., 2015). In the transgression of these boundaries, food plays a major role.

The food system has been named “the largest cause of global environmental change” (Willett et al., 2019) when quantified based on planetary boundaries. Campbell et al. (2017) concluded that agriculture alone is the main driver of change for four planetary boundaries (see Figure 4): biogeochemical flows (causing more than 90% of phosphorous flows and 85% of nitrogen flows), biosphere integrity (80%), land system change (80%), and freshwater use (85%). Further, agriculture causes 25% of climate change and 25% of ocean acidification (Campbell et al., 2017). Forty percent of global unfrozen land is dedicated to agriculture (Foley et al., 2005), and conversion of natural ecosystems to agricultural lands is the largest threat for species’ extinction, causing 80% of mammals’ and birds’ threatened status (Tilman et al., 2017). Of the more than 5,000 edible plant species, few are cultivated: the Food and Agriculture Organization (FAO) reports that 12 plant and five animal species account for 75% of global food supply (FAO, 2010). In pulling the earth system back within boundaries for a stable biosphere for humans, our food system is a great lever for change.

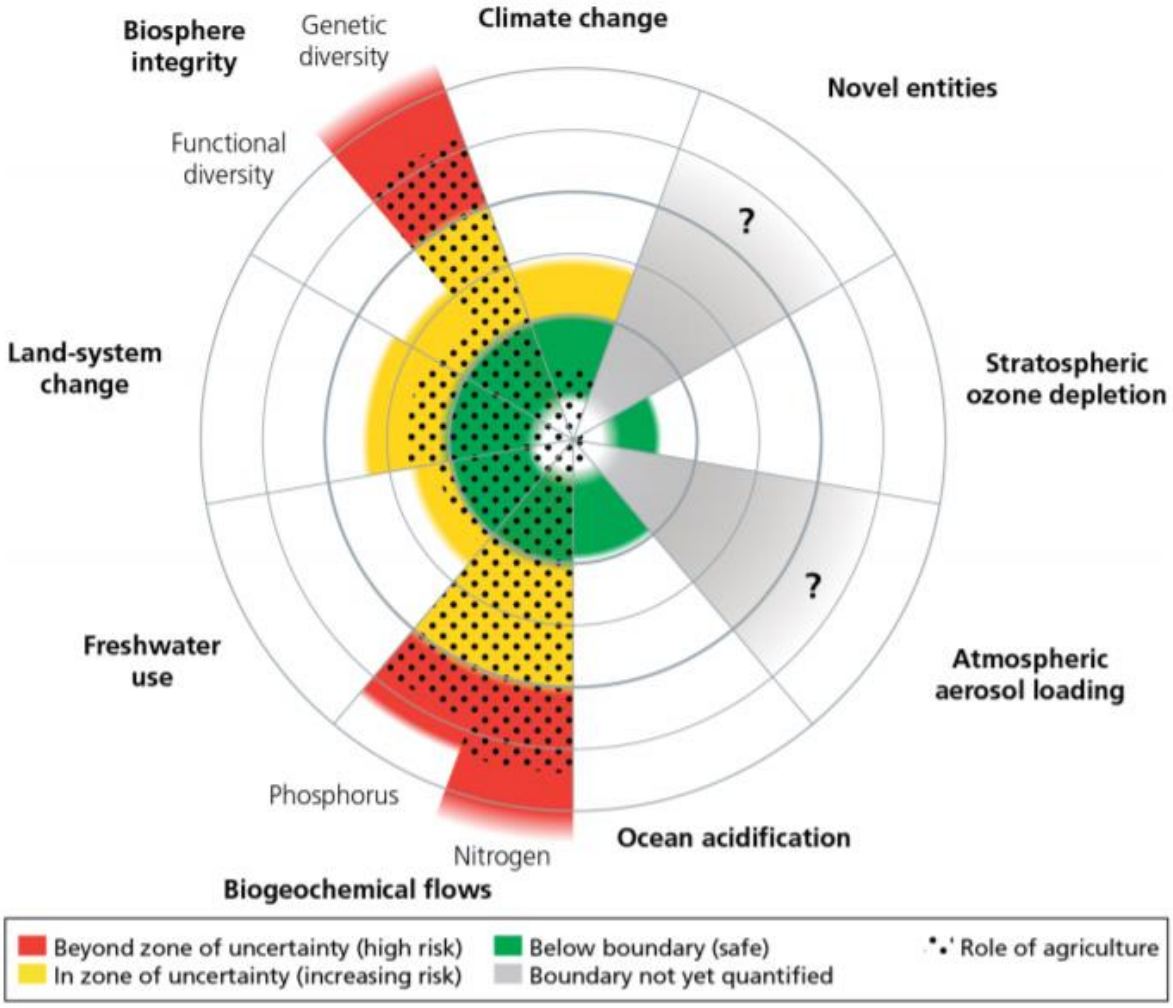

Figure 4 The planetary boundaries framework overlaid with an estimate of agriculture's role. The figure includes updates for freshwater based on Gerten et al. (2013) and Jaramillo and Destuni (2015) and an estimate for functional diversity based on Newbold et al. (2016). Figure from Campbell et al. (2017).

3.4.2 Linking biospheric sustainability and diets

Within the food system, diets are a key entry point toward biospheric sustainability. Dietary changes "deliver environmental benefits on a scale not achievable by producers" (Poore & Nemecek, 2018). By building a global, multi-indicator database, Poore and Nemecek (2018) considered the entire life cycle for 40 major foods. They calculated the life cycle impacts for greenhouse gas emissions, and use, acidification, eutrophication, and

freshwater weighed for scarcity. Their database included data from a variety of agricultural and production practices.

In their analysis, Poore and Nemecek (2018) find that even the lowest-impacting animal products exceed the average impacts of plant-based foods. For high-protein foods, this is true for the boundaries of climate change, biogeochemical flows, acidification (except for nuts), and frequently land use (see Appendix 1). Let us take, for example, the beef from the average-emitting herd in comparison to the average-emitting peas. Replacing 100 grams of protein from this beef with 100g of protein from these peas was calculated to reduce emissions of carbon dioxide equivalents by 125-fold. Their approach begins to enable comparisons from a dietary perspective.

In their modeling, Poore and Nemecek (2018) conclude that, globally, moving from current diets to ones that exclude animal products could reduce the food system's biospheric impact significantly. This shift is modeled to decrease the food system's land use by 76%, greenhouse gas emissions by 49%, acidification by around 50%, eutrophication by around 49%, and scarcity-weighted freshwater withdrawals by 19% (Poore & Nemecek, 2018).

For biospheric sustainability, and for health, transforming diets seems to be well-reasoned. The question that follows, then, is how to conceptualize these healthy and sustainable diets.

3.5 Healthy and sustainable diets

A report from the EAT-*Lancet* Commission on "food in the Anthropocene," or "healthy diets from sustainable food systems," stirred the academic conversation on healthy and sustainable diets (Willett et al., 2019). Their work was harshly criticized on the basis of conceptual and technical issues (Drewnowski, 2020; Garcia et al., 2019; McCarthy et al.,

2019; Thow & Nisbett, 2019; Torjesen, 2019; Zagmutt et al., 2019, 2020). Still, the study offers an attempt at conceiving of healthy and sustainable diets worth discussing.

In an interdisciplinary effort, the Commission gathered 19 Commissioners and 18 co-authors as experts from various fields including human health, agriculture, political science, and biospheric sustainability. Willett et al. (2019) were tasked to answer the question, "Can we feed a future population of 10 billion people a healthy diet within planetary boundaries?" More than two years of work resulted in their answer: the models say yes, for the most part, if we adhere to their reference diet, radically improve food production, and cut food waste in half (Willett et al., 2019).

To come to this conclusion, the Commission first scaled down planetary boundaries to the global food system[3]. The boundaries were set considering food production and consumption as one sector of society. For example, the planetary boundary for climate change was set at five gigatons of carbon dioxide equivalents per year (5 Gt CO_2 eq/year), considering only unavoidable methane and nitrous oxide emissions from biological processes in food production, assuming all CO_2 emissions from transporting, processing, and converting ecosystems to farms and industry have been reduced to net zero.

With the boundaries set, the Commission explored their current pressures. Models predict that we have crossed the food system boundaries set for climate change, nitrogen cycling, and biodiversity (see Table 1). These Earth system processes are also pressured past their planetary boundaries. Most of the global pressure on nitrogen flows comes from the food system. The Commission next explored how to feed the world healthy diets without transgressing the food system's planetary boundaries.

[3] Throughout the EAT-Lancet Commission's paper, they refer to the food system and food system boundaries. However, their analysis only factored in production and consumption, meaning processing, distributing, and preparing were excluded.

Table 1 Scientific targets for the food system and planetary boundaries (PB). Adapted and compiled from Willet et al (2019), Steffen et al. (2015), and updates as noted. Green text indicates levels below the planetary boundary. Orange text indicates levels above the planetary boundary within the zone of uncertainty. (The zone of uncertainty is parenthesized.) Red text indicates within the zone of high risk. Black text indicates the estimated value cannot yet be compared against the bound. Italics indicate incompatible units between food production and global values. Tg = teragram, CO_2 eq/yr = carbon dioxide equivalent per year, ppm = parts per million, km3 = square kilometers, E/MSY = extinction per million species per year.

	Control variable for food production	**Scientific target for food production**	**Food production: current estimated value**	**Control variable for PB**	**PB**	**Global current value**
Climate change	Greenhouse gas emissions (CH_4 and N_2O)	5 Gt CO_2 eq/yr (4.7-5.4)	8.5-13.7 Gt CO_2 eq/yr (CH_4, N_2O) *0 Gt CO_2/yr*	*Atmospheric CO_2 concentration in ppm‡‡*	*350 ppm CO_2 (350-400)*	*398.5 ppm CO_2*
Nitrogen cycling	Nitrogen (N) application	90 Tg of N / year (65-90, 90-130**)	130 Tg/yr	Global, industrial, intentional biological fixation of N	62 Tg N/yr (62-82)	~150 Tg N/yr
Phosphorous cycling	Phosphorous (P) application	8 Tg of P/year (6-12*, 8-16**)	Not reported	Global P flow from freshwater systems into oceans	11 Tg P/yr (11-100)	~22 Tg P/yr
Freshwater use	Consumptive freshwater use	2500 km^3 per year (1000-4000) (90% global planetary boundary)	1400-1800 km^3/year *(75-84% of global use)*	Global: maximum consumptive blue water use	2800 km^3/yr§	1800-2100 km^3/yr
Biodiversity loss	Extinction rate	10 E/MSY (1-80)	80 E/MSY	Extinction rate	<10 E/MSY (10-100)	100-1000 E/MSY
Land system change	Cropland use	13 million km^3 (11-15 million)	Crop- and grazing-land occupy 40% of ice-free landmass	Global: area of forested land as % of original forest	75% (75-54%)	62%

* Lower boundary range if improved production practices and redistribution are not adapted.
** Upper boundary range with improved production practices, more evenly distributed N application, and 50% of applied phosphorous recycled (including 50% of human waste recycled).
‡‡ The allotted emissions boundary for food production in 2050 is about half of the Intergovernmental Panel on Climate Change's pathway to a 2°C temperature rise for all emissions sources in 2050. Today, food accounts for about one quarter of greenhouse gas emissions, so the target set for food production in 2050 is twice the proportion to other sectors of today's emissions (Willett et al., 2019).
§Updated by Gerten et al. (2013)

The Commission started by optimizing a diet for nutrition reported in food groups, just as FBDGs do. This diet emphasizes consuming whole grains, vegetables, fruits, and legumes and nuts, optionally bolstered by a small amount of dairy, meat (mostly chicken), eggs, and fish, while limiting added fats and sugars (see Appendix 2). In the 2500 kilocalorie per day (kcal/day) diet, most of the calories from this diet come from whole grains (811 kcal/day), legumes and nuts (575 kcal/day), and oils/lard (450 kcal/day). By weight, the diet calls for eating more vegetables and fruits than other food groups.

The reference diet is based on evidence from controlled feeding studies with outcomes of intermediate risk factors, observational studies, randomized trials, reviews, meta-analyses, and pooled data. In the Commission's view, health is quantified by nutrient adequacy and prediction of mortality rates. The Commission's models show that a global shift to the reference diet would decrease NCDs and extend lives.

Next, the Commission modeled the effect of a global shift to this reference diet, combined with improved production practices and reduced food waste. Using country-level data built into a global food systems model, they projected various scenarios into 2050. A global transformation to the reference diet was one of three essential actions to keep the food system within its planetary boundaries (Willett et al., 2019).

Shifting to the reference diet alone was modeled to pull the food system back within its boundaries for climate change (see Appendix 3) (Willett et al., 2019). Indeed, without a shift in diet, no scenario was modeled within the bounds for climate change (Willett et al., 2019). When combined with improved production, a shift in diet was modeled to shift nitrogen and phosphorus use closer to their bounds.

Interestingly, a shift in diet was associated with poorer results in some measurements of biodiversity. It also showed no change in some scenarios for cropland use. Thus, a dialogue on biospheric sustainability should hold space for nuanced tradeoffs.

Notably, Willett et al. (2019) distinguishes these scientific targets from science-based targets. The authors claim their scientific targets do not purport an agenda, factor in feasibility or viability, nor consider fair distribution of responsibilities moving forward (Willett et al., 2019). Still, the commission called for fundamental societal change.

The last chapter of the EAT-*Lancet* Commission's report calls for the "revolutionizing agriculture," entailing rapid, "unprecedented global collaboration and commitment" (Willett et al., 2019). They advocate decarbonizing the food chain, radically circularizing nutrient use, an "urgent move toward zero loss of biodiversity," a full stop on expanding agricultural lands into natural ecosystems, conserving half of the Earth as intact ecosystems, reducing food loss and waste by 50%, and sustainably intensifying food production. In short, they call for the "Great Food Transformation" (Willett et al., 2019).

3.6 Transformational change

The academic concept of transformational change is diverse in its definition and application (Feola, 2015). In general, transformation refers to a grand, structural change rather than tinkering with incremental adjustments (Feola, 2015). Transformation is seen as an essential ability in any resilient system (Folke et al., 2010). In the concept of deliberate transformation, societies can intentionally adapt to challenges by changing the structures of our meaning: our worldviews and values (O'Brien & Sygna, 2013).

Our worldview and values are part of one sphere of influence in transformative change, the personal sphere. The political sphere addresses entry points in systems and structures, while the practical sphere deals with changes in behaviors and technical responses (see Figure 6). These three spheres of influence show levels of entry points for transformational change (O'Brien & Sygna, 2013).

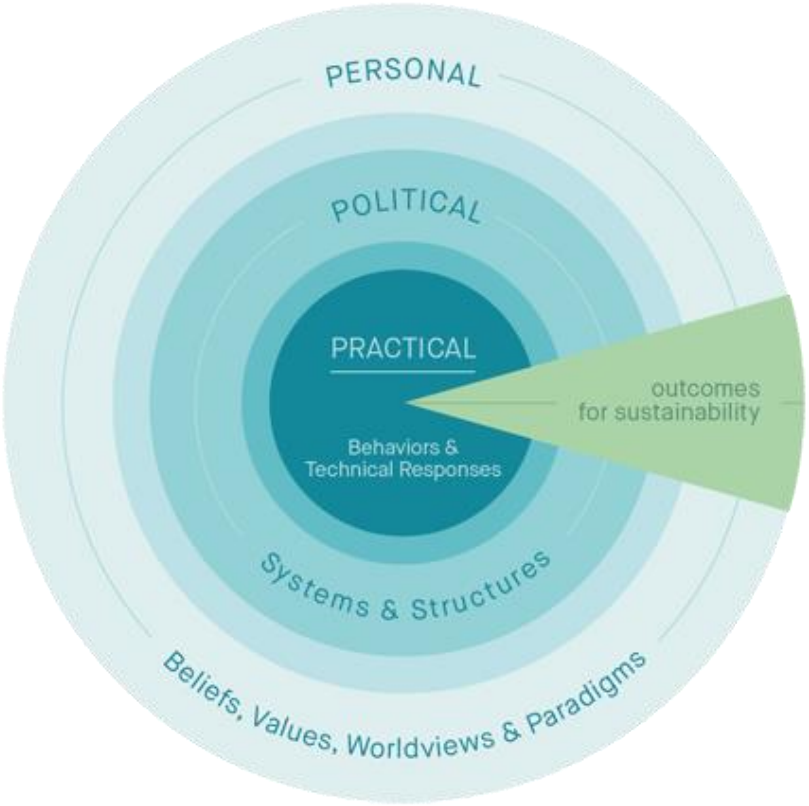

Figure 6 The three spheres of transformation and outcomes toward sustainability. Figure from O'Brien and Sygna (2013).

The call by Willet et al. (2019) for transformative change echoes those from researchers in diverse fields (Crutzen, 2002; Díaz et al., 2019; Waters et al., 2016). Dominant narratives in high-level reports emphasize the failure of the current food system (Béné et al., 2019). In the Anthropocene, humans are the greatest driver of change (Crutzen, 2002), and Raworth (2017) suggests a compass to direct a sustainable and just Anthropocene.

3.7 The Doughnut: Social minimums and ecological maximums

Raworth (2017) offers a framework that can serve as "humanity's compass in the 21st century." The framework emphasizes satisfying human rights without exceeding planetary

boundaries. Humanity should aim for this safe and just space, the "doughnut" between foundational human rights and ecological ceilings (see Figure 5) (Raworth, 2017).

The social foundations span the social and economic dimensions of sustainability. They include 12 elements, the most relevant of which to this thesis are food and health. Of the biospheric maximums, those most relevant to diets are those most pressured by agriculture: biogeochemical flows (nitrogen and phosphorus loading), land system change (land conversion), biosphere integrity (biodiversity loss), freshwater use (freshwater withdrawals), and climate change. The doughnut framing informs this thesis' view of healthy and sustainable diets as an equilibrium between minimums and maximums.

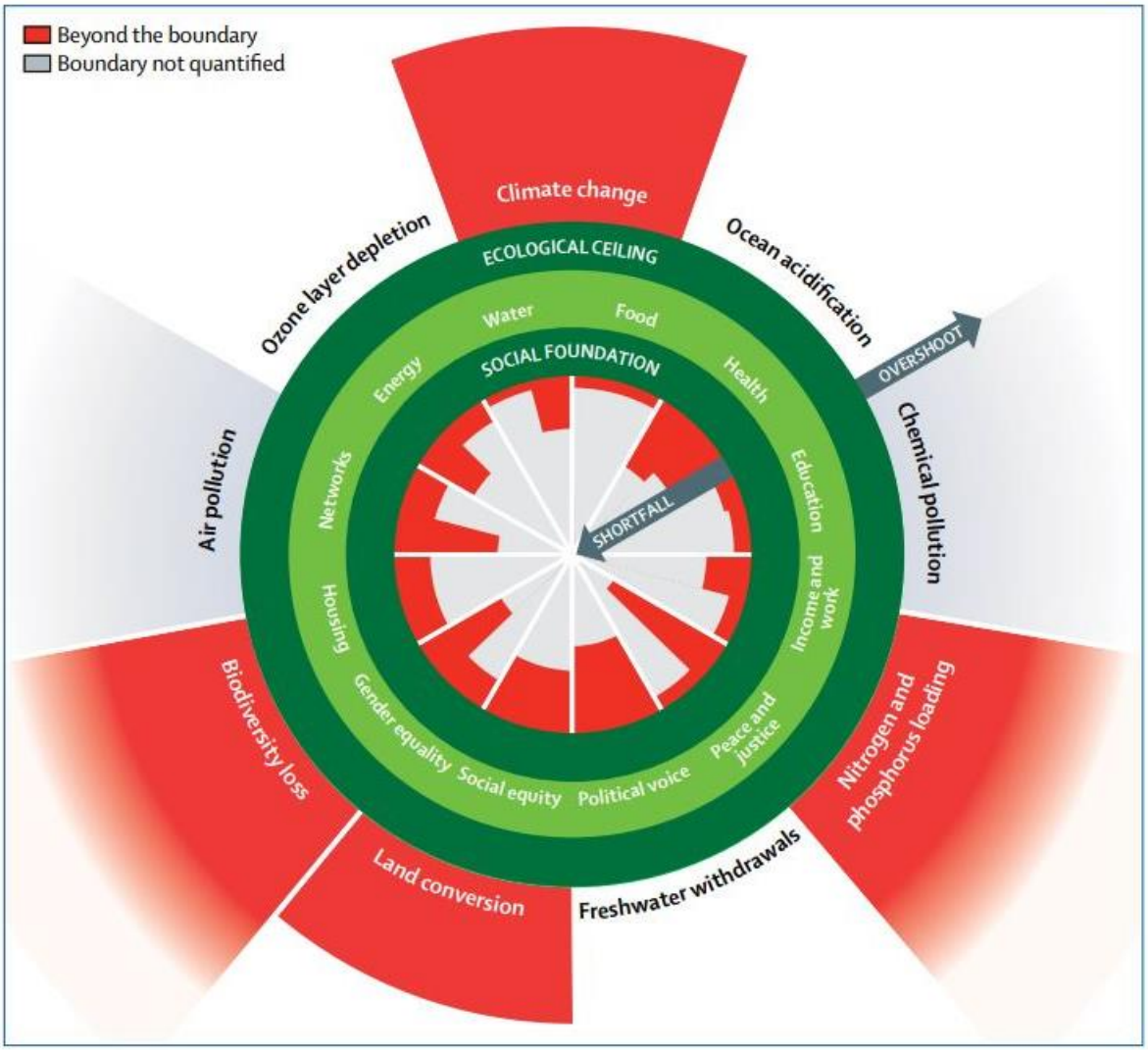

Figure 5 The doughnut of a safe and just Earth system. The green ring represents a safe and just space between red wedges of ecological overshoots and social shortfalls. The gray planetary boundaries are not quantified. Figure from Raworth (2017).

3.8 Epistemology and ontology

Critical realism acknowledges both a reality independent of thoughts and our understanding of reality (Fairclough, 2005). In other words, critical realists recognize the reality of both the natural world and the events and discourses of the social world (Fairclough, 2005). This view separates ontology from epistemology, attempting to avoid confusion between the nature of reality and our knowledge of it (Fairclough, 2005).

From this position, all knowledge is constructed through communication (Fairclough, 2005), so concepts come from reality but are always filtered through human tools. Of the tools humans use to describe the natural world, critical realists see scientific theorizing as the strongest (Herborth, 2012). Here, scientific theorizing refers to method-driven, peer-reviewed research (Herborth, 2012), or using the system of science to explain why or how a phenomenon comes to be. Still, this method of understanding does not accurately portray the natural world, as it is a human-constructed derivative of reality filtered through language. This framing directs the thesis.

4. Research Design and Methods

This qualitative study aims to explore Oslo's messages about healthy and sustainable diets and underlying conceptualizations of health and sustainability. Its flexible design consists of actor mapping, interviews, and discourse analysis. The aim is to map a wide variety of these messages and their conceptual basis, not to weigh them by their influence.

4.1 Subjective positioning

In this thesis, I practice reflexive positioning. In part, I do so to increase the transparency of the methods. This is especially relevant for the discourse analysis process. Further, I use this thesis to make introductory steps toward deliberate transformation. Transformative change "opens up a ground for scientists to engage with change processes" (Feola, 2015), and I use this thesis to practice intentionally transforming my own viewpoints. As I sample, select, analyze, and write about messages in my nearby foodscape, I challenge my own integration of those messages. Through reviewing literature, I create space to reconsider and reframe my own concepts of health and sustainability. Discourse analysis is a means to inform and transform my conceptualization of health and sustainability. Conversely,

reflexive positioning allows me to show how my experiences have influenced the results of this discourse analysis.

4.2 Spatial and temporal setting

This study includes actors within Oslo, Norway. Oslo is Norway's capital and largest city, constituting a county and a municipality (Thorsnæs, 2020). Oslo is home to one-tenth of Norwegian residents, and one-fifth of residents live in the metropolitan area. However, Norway's strong rural-urban divide makes Oslo an incomplete picture of the nation (Thorsnæs, 2020). Situated at the head of the Oslo Fjord, its harbor is the largest and busiest in the country (Thorsnæs, 2020).

Oslo relies heavily on food imports, as Norway consists of about 3% arable land and has a short growing season (Asdal, 2008). In 2017, 11% of Norway's total import value was for agricultural and food products, mostly from Sweden, the Netherlands, Denmark, and Germany (Asdal, 2008). Norway imports staple crops, including wheat, though the country also produces and exports a variety of these crops.

Oslo serves as a center for local and global research on scientific targets for healthy and sustainable diets. It homes the headquarters of the EAT Foundation, part of a commission on healthy diets from sustainable food systems in *The Lancet*. EAT's founder was appointed as a Chair of the United Nation's Food Systems Summit 2021 (EAT, 2020). The conversation on sustainable and healthy diets is lively in Oslo, and reports on this topic are tailored for Oslo and Norway. As a resident of nearby Ås, I have access to Oslo and could form connections with local contacts. These factors make Oslo an ideal setting for this thesis.

The data was gathered from September to early November 2020. All published texts selected for the discourse analysis were publicly available during that time.

4.3 Selecting actors and their texts

4.3.1 Population

The study's population is Oslo-based actors making public claims about healthy and sustainable diets. This thesis identifies actors through non-probability, purposive, theoretical selection, with contingent criteria development and sequential selection (Bryman, 2016, pp. 420–430). This selection method aims to identify representative messages that could publicly reach the Oslo resident concerned with a healthy and sustainable diet.

Here, continuous sampling paired with contingent criteria development and sequential selection enables a fairly wide scope to understand what this representative information is (Bryman, 2016, pp. 420–430). However, this thesis does not attempt to provide a systematic review with a maximum scope of the public discourse. Different social positions might reveal different discourses in the analysis, so the selection spans a spread of positions within society (Slade & Priebe, 2007), from grocery stores to research institutes and nonprofits. For this reason, actor mapping proved a useful tool.

4.3.2 Actor mapping

I performed a literature review to support and develop methodology. In this literature review, one especially relevant study by Godin and Sahakian (2018) first mapped 90 institutional actors in Switzerland before identifying their relevant texts. Their study used an inductive approach to categorize actors by who they are, what they do, and through what methods (L. Godin, personal communication, June 18, 2020). L. Godin (personal communication, June 18, 2020) tried visualizations through social network analysis, but for simplicity built the actor database in Microsoft Excel. With this study in mind, I searched for actors.

Social network analysis maps actors by their relationships (Marin & Wellman, 2011). They do not distinguish individuals by their attributes, like race, gender, or education, but instead by what social circles they have access to (Marin & Wellman, 2011). As I aimed to identify actors in diverse roles of society, this method helped sort actors by their roles in society, not individual qualities. I did not perform a social network analysis, but this method informed my method of mapping actors by their organization's societal role.

I drew mind maps of potential actors, first by hand and then digitally. For digital maps, I used MindMeister, a free online tool. The digital map used the names of institutions, not individuals. I expanded the map as I identified potential actors. This process involved brainstorming, "on-the-ground" exploration, online searches, conversation with colleagues, and literature review. Some potential actors were already known at the start of the study, like national public health bodies, while others were discovered through the process, such as restaurants and foraging associations.

As a criterion, the actor's messages must be public, readily accessible by a concerned Oslo resident. As such, actors with only academic publications were excluded from the study, as this discourse often occurs behind paywalls. Of course, the paywalls of scientific journals are not the only barriers to the scientific or academic conversation. While the public can technically retrieve some of these actors' texts, academic language limits accessibility of some texts. As such, I excluded all academic texts, including open-source publications.

The potential actors include relevant international, national, and city government offices; research institutes and "think-do tanks" (which research and enact social change); non-governmental organizations (NGOs); mid-chain actors in the food system; organizations disrupting food waste; alternative food producers' and foragers' associations; presenters at relevant conferences; and messages within the foodscape including newspapers and magazines, advertisements within grocery stores and restaurants, and food labelers.

Starting by mapping potential actors proved advantageous for a few reasons. I could keep track of texts' sources, connecting them to the actors' interests. Further, it helped refine the research scope. For example, this approach forced me to focus on diets, excluding actors whose messages only addressed specific foods, food waste, or agricultural production. Likewise, I had to define messages as prescriptions and claims, which call for action or state what is best for one to do. This forced me to omit actors who do not call for changes in practices for healthy and sustainable diets.

Starting with actors also helped filter out texts that lacked a clear actor, which would be difficult to analyze in the discourse analysis. Similarly, I could avoid collecting repetitive messages from the same actors. The method did not reveal every actor publicly offering messages on healthy and sustainable diets, nor provide a perfectly representative sample. However, using actor mapping assisted toward a broad overview of diverse sets of actors with a variety of societal positions.

4.3.3 Actor and initial text selection

With the maps of the potential actors at hand, I looked through the potential actors' texts in select genres. Prescriptions and claims came from eight genres: photographs within the foodscape, governmental publications, reports, newspapers and magazines, websites, events (online and in person), interviews, and public forums. The physical sites for exploration were limited to Oslo Central Station's foodscape, including restaurant rows, shopping centers, and grocers within and adjoining the station. When COVID-19 restrictions increased, the study turned to website analysis.

As new varieties of actors emerged, they were subjected to current criteria and influenced future criteria, allowing for flexibility and refining. As relevant texts were photographed or found online, the actors behind these texts were considered potential actors. They remained potential actors until criteria iteratively emerged.

The main criterion was that the actors' text made a public prescription or claim about healthy and sustainable diets. Texts were omitted if they included only health or sustainability, if they focused on individual foods instead of relative amounts within diets over time, or if they did not motivate a shift in practices. Although wasting food certainly affects the sustainability of one's food practices, food waste was not considered a part of one's diet. Thus, messages about the practice of wasting or saving food were not enough to select the actor. If an actors' text fit the criteria, the actor was selected, and their text was saved for discourse analysis.

I used the database Atext to identify newspapers and magazines as potential actors. I searched for articles containing prescriptions and claims for healthy and sustainable diets. I used the keywords "healthy sustainable diet" and the Norwegian equivalents, "*sunn bærekraftig kosthold*" and "*sunt bærekraftig kosthold*" for articles published between June 1 and October 6, 2020. The queries resulted in 71 articles, which were filtered for repeated articles. The articles were further filtered to 24 articles to exclude publications not distributed in Oslo. These articles were translated then further reduced to 20 articles that contained a prescription or claim. The associated publications were selected as actors, and the articles were saved.

Using the Ecosia and Google search engines, I looked for further actors. I found websites of major grocery store chains, restaurants, NGOs and nonprofits, research institutes, think-do tanks, and the five CSAs in Oslo. Some of these potential actors were selected, and their texts were saved.

Additionally, the Nordic Nutrition Recommendations' webpage led me to the public forum for submitting requests and considerations for the deliberation process. Here, I also found an online event hosted by the Nordic Council of Ministers to discuss how to include sustainability in the next edition of the Nordic Nutrition Recommendations. I attended the

online event, received recordings from the hosts, and transcribed the event. However, in limiting the texts to a feasible scope, I prioritized more public messages over this webinar.

Sometimes, a clear prescription or claim was not found from a potential actor within the dates selected mediums for this study. In some cases, this was because initial probing showed that the actor was not engaged with the topic of healthy and sustainable diets, so they were not selected. In other cases, though no prescription was identified in online texts, actors actively engaged with the subject of healthy and sustainable diets, in some cases giving public presentations on the topic. These potential actors were contacted for interviews.

4.3.4 Interviews

The sampling for interviews was purposeful in design, to determine if the actors publicly assert prescriptions or claims and to obtain those messages. Those contacted for interviews include representatives of restaurants, shops, and all five CSAs in Oslo; a community educator for foraging; two youth environmental organizations working on food systems; the editor in chief of *Ren Mat,* or Pure Food, magazine; a nutritionist at Organic Norway (*Økologisk Norge*); the board of the Organic-Biodynamic Association (*Biologisk-dynamisk Forening*); and speakers at the Future of Food conference in Oslo with speech titles related to health and sustainability.

Initial requests for interviews resulted in opportunistic sampling of further contacts that agreed to be interviewed, including researchers at the institute Nofima, a project manager in Oslo municipality, an intern at EAT, and two project managers at a think-do tank called Neighborhood Gardens (*Nabolagshager*).

The interviews were semi-structured using a loose interview guide (see Appendix 4). Interviews were conducted by phone or on video call (see Appendix 5). Most interviews took place with both parties in an office at work or home. However, the Board Member of the Biodynamic Association was interviewed while he was outside on his farm, with sounds of

chickens in the background. The interviews lasted between 18 minutes and one hour and two minutes, with one exception.

The interview with the Community Educator in a foraging group lasted approximately four hours. It took place in the Educator's home and included tours of her frozen stocks of foraged foods. During much of the conversation, the Educator told stories and showed photos of edible species. Much of the interview strayed from the research topic.

If the interviewee did publicly assert messages for what to eat for health and sustainability, they were selected as actors and their interviews included as texts. In total, 15 actors were selected and their interviews were included as texts in the analysis (see Appendix 5). When potential actors were either selected or omitted, the actor selection was considered complete for this study. Then, I searched for further messages from these selected actors.

4.3.5 Selecting further texts containing prescriptions and claims

For each selected actor, I searched additional genres for more texts containing prescriptions or claims. At first, TV, podcasts, and food labels were considered as genres. However, they were all excluded when reducing the texts for time and resource feasibility. Podcasts and TV were excluded due to language barriers: they would require transcription by a Norwegian speaker and translation. Food labels such as "Vegan," "MSC," and the "Nordic Keyhole" were excluded for referring to individual foods, not diets.

Social media was considered to fill in the gaps from smaller and more informal groups, like community organizations. However, searching for data pieces in social media was a "disorienting, time-consuming, and overwhelming experience" (Hookaway, 2008, p. 207, as cited in McLennan & Prinsen, 2014, p. 93). Understanding the algorithms social media uses to determine one's content was outside of the scope of this thesis. Thus, I could not be sure of what content could reach Oslo residents concerned with healthy and sustainable diets. Additionally, I did not aim to describe the discourse dominated by social

media corporations fueled by advertisements, aiming the study instead toward diverse forms of public discourse. For these reasons, I excluded social media.

In selecting data, I considered the medium, breadth, and depth of each text. For short texts, multiple texts from the same actor in the same genre were used together to understand their message for a healthy and sustainable diet. For example, on the grocery stores Coop's webpages, messages about healthy and sustainable diets do not necessarily have to appear in one cohesive statement. Rather, the texts were aggregated to form Coop's website claims for a healthy and sustainable diet (Coop, n.d.–a, n.d.–b, n.d.–c). Similarly, if messages for health appeared messages for sustainability in Oslo Central, the photos of both are included, as the experience of the person in the foodscape places these items in juxtaposition.

In contrast, in longer texts, I only include sections that relate to both health and sustainability for diets. For example, the Nordic Nutrition Recommendations 2012 is a document of over 600 pages covering recommendations for dozens of individual nutrients, as well as more general sections regarding dietary patterns and macronutrients. One chapter also considers "environmental issues" (Nordic Council of Ministers, 2014, pp. 137–154). This chapter was included in the discourse analysis.

The texts selected are shown in Appendix 6 and presented with their actors in the Results chapter. More texts were collected than could be analyzed within time constraints. Redundant texts from the same actor were omitted.

4.4 Language, transcription, and translation

I am a native English speaker, and I have learned some Norwegian. I completed an introductory Norwegian course online and studied vocabulary related to sustainability, health, and food with an online tutor. This aided in the sampling of actors and their messages,

especially when scanning online documents and messages in foodscapes. It also helped with outreach to schedule interviews. This process was bolstered by physical and online translation tools like dictionaries and Google Translate.

As a non-native speaker, media analysis required professional translation (McLennan & Prinsen, 2014, p. 85). A professional translator translated Norwegian articles to English. I checked the translations, focusing on key terms for this study. For example, discussions led to correcting “eat greener” to “eat more greens” and “meal” to “diet.” Most governmental and NGO documents were available in English, and interviews were conducted in English. Toward the end of analysis, I was competent in translating short texts.

I transcribed interviews using Transcribe by Wreally. Transcribe is an online platform offering an interface that streamlines one’s transcription process. It integrates audio, text, and keyboard commands for looping, speed adjustment, and pausing. They also offer automatic transcriptions using artificial intelligence. Most interviews were transcribed manually, but longer interviews and online events were automatically transcribed then edited manually.

The transcriptions and translations were paid for with the Norwegian-American Association’s Scholarship for Americans researching in Norway, which provided 20,000 NOK. This budget also covers the subscriptions for the tools Adobe Illustrator and NVivo, printing of articles and data, Norwegian language tutoring, books, and some living costs.

4.5 Discourse analysis

Discourse analysis oscillates its focus between the broader order of discourse (the social structures) and specific texts (events) (Fairclough, 2003, p. 3). Social practices control which events are selected from the social structures (see Figure 7). In this way, discourse analysis bridges social theory and language analysis to look at language contextualized in

social structures. In other words, social research informs the text analysis, and text analysis enhances social research (Fairclough, 2003, p. 3).

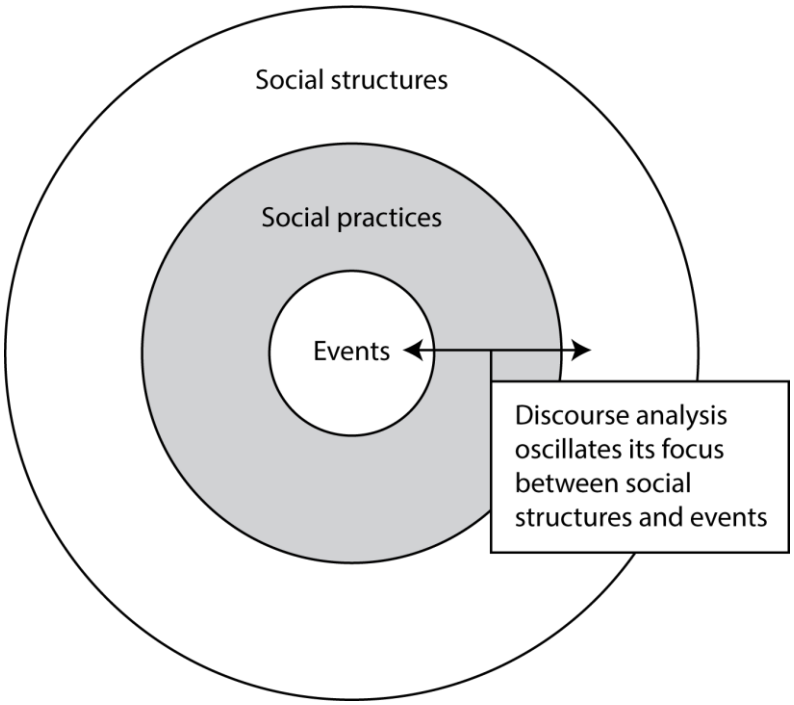

Figure 7 Relating social structures, social practices, and events. Discourse analysis oscillates its focus between specific events which actually occur (texts) and the range of possibilities defined by social structures (the order of discourse). Social practices control what events are selected from the possibilities (Fairclough, 2003, 3, 23-25). Figure by author, made with Adobe Illustrator.

I used Fairclough's framework for textually-oriented discourse analysis (Fairclough, 2003, pp. 209–210). Specifically, I started with a social problem that had a semiotic element. Then, I identified challenges within this social problem by analyzing the discourse around it. I identified possible ways past the obstacle, and I reflected on my position in the analysis.

Discourse analysis is often informed by a social constructivist worldview (Fairclough, 2003, p. 2). However, I take a critical realist stance in this thesis. Though not as predominant, critical realism has precedence in discourse analysis (Barros, 2014; Fairclough, 2003, p. 23; Riley et al., 2007; Sims-Schouten et al., 2007). This thesis assesses a wide variety of texts. A critical realists' view on meaning-making enables a classification of these texts based on their proximity to scientific theorizing.

4.5.1 My process

Each text, translated and transcribed, was uploaded into the software used for analysis, NVivo. NVivo is a software for qualitative data analysis. For this thesis, I took a brief online course to understand its interface and capacities. It allows researchers to organize and analyze data using coding and query functions. As each text was uploaded, it was coded to its "case," the actor producing the text.

A series of iterative steps (Harper, 2007, pp. 50–51) helped me break down the process of discourse analysis. First, I simply read the data. Then, I read all the data again, taking general notes. Next, I generated possible codes based on manifest meaning, latent meaning, content features, and discursive features (Fairclough, 2003, pp. 10–13). Iteratively, I inductively identified key themes.

Through this process, I developed my first set of codes. The first two distinguished positive from negative messages: "prescriptions of what to eat/eat a lot of/eat more of" and "prescriptions of what to not eat/limit/eat less of." Within positive and negative prescriptions, I created very specific primary codes, such as "berries," "fat," and "vegetarian." Through rounds of coding, primary codes aggregated.

Similarly, I developed codes for concepts underlying the prescriptions. At first, they included the actors' "concept of sustainability," "concept of unsustainability," "concept of health," and "concept of unhealth." These codes were later distinguished from similar concepts that did not themselves define sustainability or health.

Differentiating between prescriptions and concepts illuminated a need for a third category: claims. I added codes for "claims of what to eat/eat a lot of/ eat more of" and "claims of what not to eat/limit/eat less of." These eight codes became key in the early rounds: positive and negative prescriptions, positive and negative claims, concepts of sustainability and unsustainability, and concepts of health and unhealth.

Through coding, “intuitive hunches” (Slade & Priebe, 2007) for discursive themes emerged. Each text was cross-coded for these themes. Some of these hunches became frameworks for reporting the analysis, especially (1) on what level the message addressed sustainability and health; (2) the strength of language pushing the reader to action; (3) the sources the text defends its claims with; and (4) how texts conflate or distinguish between sustainability and health. Throughout further readings of texts, an index for themes and discursive features arose.

The codes and themes were refined through iterative readings. A varying number of intermediate codes bridged primary codes and high-level aggregates. I checked the data against themes and looked for counter examples, using coding, crosstab, and compound queries in the Explore function of NVivo. I also used the text search function to find further examples of key discursive features.

Throughout the process, I generated a mind map of codes, first using NVivo. I soon switched to the free online program MindMeister, which was more user-friendly. In this way, I translated my NVivo coding into a flexible and ever-growing mind map of prescriptions, claims, concepts, and themes.

As my mind map grew, I began writing preliminary analyses. I tested themes and discursive features against data with a critical eye for context. Iteratively, a framework emerged that could accommodate the diverse discourse, marking the transition from the discourse analysis into the discussion.

4.5.2 Strengths

Mind mapping and NVivo allowed me to accommodate the discourse’s breadth on varying levels of depth. To start, in NVivo I could code the same element to multiple different themes. Then, I could then contextualize one theme as a part of or containing another theme in the mind map, adding layers as the analysis progressed. The ability to zoom

in and out on maps facilitated my ability to link parts to their wholes, or meronyms to their holonyms. Identifying which prescriptions, claims, and concepts were nested within each other helped me to stay close to my data, even at higher layers of analysis. These tools allow me to trace a theme back to the primary codes and the actors' original texts. Even more importantly, they allowed me to see this discourse as a whole.

Discourse analysis offers many strengths. It does not sacrifice validity for repeatability or reliability (Harper, 2007). If done well, this face validity resonates with readers (Harper, 2007), which I strived for in this thesis. Further, the method functions well in spaces where issues are contested (Harper, 2007), which this topic certainly is. Despite these strengths, there are also limitations.

4.5.3 Challenges

Challenges arose when using discourse analysis. The results of this thesis are limited to the selected actors and their texts. They are local and provisional. However, even bounded by locality and temporality, the method allowed me to contribute new theoretical insights that are fruitful for the surrounding body of research (Harper, 2007).

In some contexts, discourse analyses are at risk of being judged according to dominant paradigms of realist approaches. Personally, coming from a natural science background, I risk falling into a hypothesis-driven, deductive trap, either when framing my research questions or by extrapolating my results. Further, as an individual deeply curious and concerned about healthy and sustainable diets, I also risk allowing my preconceived notions to select examples that reinforce the narrative I expect to see. Reflective, attentive, and iterative analysis helped address these issues. Indeed, discourse analysis is not a method which can be learned mechanistically and applied routinely, but is a constant and active endeavor (Harper, 2007). As such, I invested in my own familiarity with extensive literature. I also drew upon ample time, persistence, and adaptability throughout the analysis.

As a critical realist using discourse analysis, I ran the risk of analyzing with a relativist and constructionist style common to the method and then implicitly claiming my accounts to be true (Harper, 2007). Instead, I emphasize that one text in the analysis is not more real than the other, but it could be more scientifically sound.

The results of this discourse analysis could be misinterpreted as criticism of the actors and speakers themselves. Thus, I emphasize that actors do not necessarily intend to use discourse as I describe. Indeed, though discourse analysis aims to interpret the text within its social context, it is problematic to assume the authors' intent (Fairclough, 2003, p. 11). I offer the reader each actor's interests for consideration but suppose authors' intentions.

I acknowledge myself as the author of one interpretation of these texts, so this discourse analysis does not claim to hold the only true interpretation. As such, I can practice reflexivity. Rather than simply acknowledging my social positions, I can reflexively identify aspects of my lived experience that influence the study and trace these into the analysis.

4.6 Reflection: Challenges and opportunities of COVID-19

The COVID-19 pandemic placed constraints on this thesis. Experiencing the pandemic also provided unexpected opportunities. These challenges and opportunities were formative in the study design.

In March 2020, I was pursuing an internship abroad in the Netherlands. As a United States citizen, my Dutch visa lasted until May. I had applied for a Norwegian residence permit to return to Norway and write my thesis in May.

When workplaces closed due to COVID-19, the Norwegian Immigration Department, UDI, could not access their offices. As a result, my visa's processing was paused. In correspondence with UDI, I stayed with my partner's family in Germany, who I was visiting

at the time of the border closure. His parents served as a pandemic nurse and doctor, and the thesis progress was significantly slowed as we supported each other. When his parents and siblings contracted the virus, my partner and I served as caregivers until we became sick, and this thesis' progress halted.

Upon my recovery, my Dutch visa would soon expire. This meant my right to be in Europe would also expire. UDI informed me that I could come to Norway to wait for my Norwegian student permit to be approved. Upon arrival at Gardermoen airport near Oslo, I was told that I was misinformed. Due to a COVID-19 travel restriction, I could not enter without a processed permit. I could not return to Germany or the Netherlands, which had similar travel restrictions. I had to return to the United States.

Interestingly, since the first flight back to the States was five days later, I was allowed to take public transit from the airport to my home in Ås to wait for my flight. Because my passport was held by the authorities, it appeared I had never entered the country. In reality, I had to return to the airport via public transport, without completing the required two weeks of quarantine. This experience opened up space for me to reflect upon public measures meant to keep populations healthy.

Because I had not lived in the United States for two years, upon my arrival, I took time to arrange housing, health care, and income, while under quarantine. Much of my personal and academic belongings stayed in Norway, including textbooks, notes, printed articles, and study materials.

To adapt to these challenges, once settled in the U.S., I began working with an academic coach to provide some element of an academic community. This helped me restart investing in my thesis and building studying habits. In July, I started working with a Norwegian language tutor online. Unlocking a bit of the Norwegian language allowed me to begin gathering data, much of which was in Norwegian.

At the end of July, my visa was processed, and I was able to return to Norway. After settling, I began working on the thesis again in August. At that time, social distancing measures were moderate. I spent three days collecting foodscape photographs in Oslo Central Station, following national safety guidelines.

Soon afterward, regulations shifted as cases increased, and foodscape analysis in-person no longer felt ethical or safe. To keep the study resilient, I shifted the focus to analysis of websites of the restaurants, grocery stores, and organizations that I planned to visit in person. Likewise, interviews were conducted via phone and online. Phone and video chat interviews restricted observations during the interview (Schiffrin et al., 2001), especially because the interviewee and interviewer experience different settings.

Reorganizing my life and continuously following up with the visa renewal process took time and energy from March 2020 through the end of the thesis in March 2021. Because the United States' progress with handling the virus was delayed in relation to Europe, I experienced the several peaks of infections and lockdowns in both continents. This affected my access to library materials, meetings, resources, suitable workspaces, an academic community, language courses, community language cafes, and daily language exposure throughout the thesis. The experience also tested my resilience.

The pandemic gave me entry points to reflect upon the topics explored in this thesis. I have a bachelor's degree in biological sciences and professional experience in infectious disease research. These pursuits led me to a disease-oriented, reductionist view of health. Living through the pandemic pushed me to widen my concept of health. In the last year of isolation and lockdowns, I had to attentively care for my own social, economic, intellectual, emotional, and spiritual health. In these realms, a disease-focused mindset was of little use. Health, I am learning, is much more than avoiding disease.

Likewise, in my current master's in International Environmental Studies, I have learned about elements of sustainability. In the beginning, I focused on biospheric

sustainability. I was especially drawn to the planetary boundaries concept, as it fit neatly into my understanding of the world. Scaling down the planetary boundaries to my local context, and factoring them into my own behavioral decisions, required me to step outside of the clear-cut relationships that my natural science background provided. Then, the pandemic opened up dialogues on unsustainability of our global, industrial food system in mainstream messages. Many aspects of life changed during the pandemic, creating space for me to question how my own life, and food practices, rely on unsustainable structures and practices.

The pandemic expanded my understanding of health and sustainability. It created space for me to explore how these concepts relate. Further, working in this field, it is easy for one to feel called to affect change. I used this thesis as an opportunity to explore theories of change, for my research and for directing my own practices. This experience was essential for the development of this thesis as it reads today.

4.7 Consent

Most texts in this study were published for public use. For interviews, I obtained consent from interviewees. Each interviewee agreed to be recorded and that the transcript could be used for analysis in the thesis. I registered the study through the Norwegian Center for Research Data (NSD) on Tuesday, November 3rd, 2020, and my request was approved on December 7th. Then, I sent each interviewee a transcription of their interview, the audio file of the interview, and a participant invitation developed with NSD. The interviewees confirmed their agreement to partake in the study. For anonymization, interviewees are referred to by their position within their organization. Some interviewees serve a public role. In this case, I have sent direct quotes to the interviewee to confirm an accurate transcription. All interviewees will receive the final version of this thesis by email, as prearranged.

5. Results

This chapter introduces the actors and their texts. It presents their prescriptions, claims, sources, and underlying concepts. The results are limited to the selected actors and their texts, and they are local and provisional.

5.1 Actors and their texts containing prescriptions and claims

Sixty-five actors were selected for making public claims about healthy and sustainable diets (see Figure 8). This includes five governmental bodies, three research institutes and "think-do tanks" (which research and enact social change), and four non-governmental organizations (NGOs). The popular media articles came from eight newspapers and eight magazines. Further, the study includes two actors in the middle of the food value chain ("mid-chain" actors), five grocery stores, five restaurants, and seven food products. Two out of Oslo's five Community Supported Agriculture organizations (CSAs) and one community foraging group were also included. Finally, the actors include 15 commenters in the public forum by the Nordic Council of Ministers (NCM). This forum called for comments on the 2022 update of the Nordic Nutrition Recommendations (NNR).

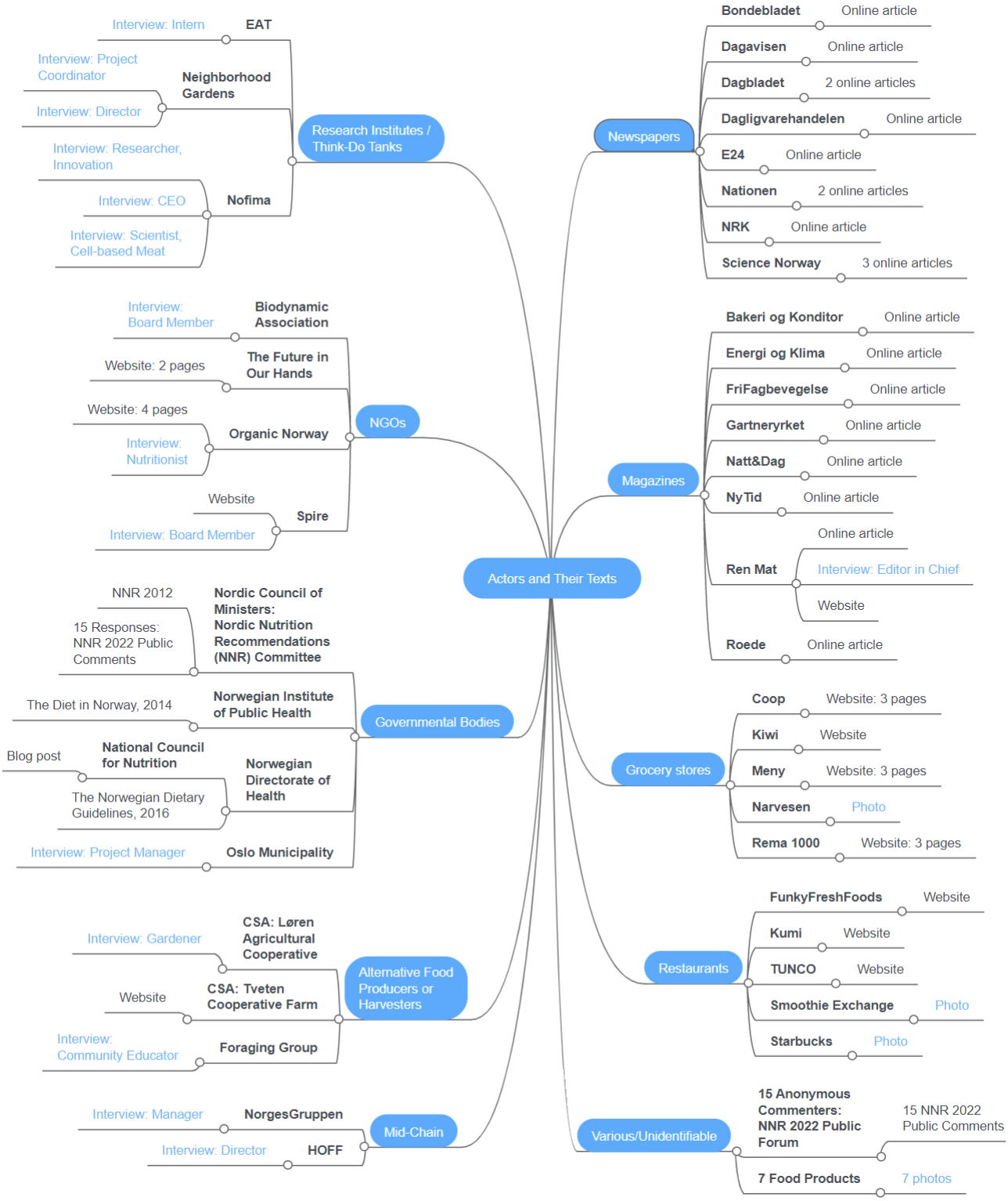

Figure 8 Selected actors and their texts used in discourse analysis. The texts contain claims or prescriptions for healthy and sustainable diets in Oslo. Actors appear in bold. Texts in black are published publicly (see Appendix 6). Texts in blue are interviews (see Appendix 5) and photos gathered by the author (see Appendix 7). Figure by author, made with MindMeister.

From these actors, 102 texts were analyzed (see Figure 8). They include text from 10 photos of Oslo Central Station's foodscape; 20 newspaper and magazine articles; 25 web pages; 15 interview transcriptions; the Norwegian Directorate of Health's (NDH, *Helsedirektoratet*) dietary guidelines; the NNR 2012; and 15 comments from and responses to the NNR Committee's public forum on NNR 2022 (see Appendixes 5, 6, and 7).

This thesis casts a wide net for messages. The sources actors use to support their messages range in their proximity to scientific theorizing while still purporting public messages. Though actors promote diets based on health and sustainability, these may not be the actors' main interests. To show diversity of actors selected, their self-proclaimed interests are presented next, structured by their proximity to scientific theorizing[4].

5.1.1 Actors who conduct basic research or literature reviews which are peer reviewed

To start, the Norwegian Institute of Public Health (NIPH) conducts the peer-reviewed research behind their messages. According to their website, the NIPH (2016) researches and systematically reviews Norway's health status and advises on many topics, including nutrition and environmental health. With an annual budget of 1.7 billion NOK, the NIPH works to cultivate a health-promoting society with long life expectancy and social equality.

As an applied research institute, Nofima also conducts research. However, they aim to "provide competitive advantages along the complete value chain" in food (Nofima, n.d.). They have a vision of "sustainable food for all" and a strategy built around the United Nation's (UN) Sustainable Development Goals (SDGs), and they are mostly owned by the Norwegian government under the Ministry of Trade, Industry, and Fisheries and the Foundation for Agricultural Food Research (Nofima, n.d.). Their annual turnover of about

[4] When multiple texts from one actor are included in the analysis, the most prevalent type of sourcing (and usually the closest to the scientific method) determines where the actor is grouped. These categories do not describe every source the actor uses, but describe those most cited in the texts of this discourse analysis.

675 million NOK comes mostly from industry research funds, industrial sponsors, and the EU and Norwegian governments (Nofima, n.d.).

The Nordic Council of Ministers' (NCM) NNR Committee conducts systematic literature reviews which are followed by a peer-review process. The NCM is the intergovernmental cooperation in the Nordics[5] (Nordic Co-operation, n.d.). The body's public vision is for the Nordic region to become "the most sustainable… region in the world by 2030" (Nordic Co-operation, n.d.). They requested that the NNR 2022 integrate sustainability into the analysis (NNR Committee, 2020).

The NCM's NNR Committee includes a Scientific Project Secretary, ten nationally appointed committee members, and the Scientific Advisory Group of international scientists (NNR Committee, 2020). The Scientific Advisory Group advises on principles and methodologies for updating the NNR, including using systematic literature reviews. According to their website, the NNR Committee (2020) publicly calls for Nordic experts and appoints at least two per chapter. The NNR 2022 aims for transparency, hosting a public webinar, responding to public forum questions, and posting meeting notes. Their peer-reviewed literature review is published publicly and used as the basis for national FBDGs.

5.1.2 Actors who cite peer-reviewed research

Next, the NDH and their National Council for Nutrition (NCN) (*Nasjonalt råd for ernæring*) cite research, but their texts are not peer-reviewed. They cite systematic reviews, specific scientific journals, and individual studies. The NNR's literature review is translated into FBDGs by the NDH. The NDH cites the NNR, though they lack traceability in their additional methods and sources.

[5] The NCM is a cooperation between Denmark, Finland, Iceland, Norway, Sweden, Greenland, the Faroe Islands, and Åland.

According to their website, the NDH (2019a) aims to "better the quality in the health service and to promote factors that bring good health to the population." As an executive agency, they have a public mandate to use policy to improve individual and community health across services, sectors, and administrative levels. Among other roles, the NDH monitors public health conditions, gives advice and guidance, makes the national health plan, and administers grants. The NDH does not have a branch or department dedicated solely to nutrition, but it does have the NCN.

The NNR 2012, along with a report from 2011 by the NCN called "Dietary advice for promoting public health and preventing chronic disease," served as the basis for the NDH's current FBDGs. However, the FBDGs usually factor in national dietary trends and industry factors, recommending diets close to the norms. These sociocultural and industry factors are often difficult to trace; the publication itself does not offer a methods section to illuminate their discernment process (Norwegian Directorate of Health, 2014). Still, the NDH operates with a public health mission and has traceable roots to scientific theorizing.

The NCN claims to aim their work on nutrition toward a healthy population informed by science (Norwegian Directorate of Health, 2019b). The NCN's report, *Sustainable Diet* (*Bærekraftig Kosthold*) (National Council for Nutrition, 2017a), refers to research articles systematically, interspersed with secondary sources. Though the report itself could not be translated from Norwegian into English for this thesis, a summary of this report on the NCN's official website was analyzed (National Council for Nutrition, 2017b).

5.1.3 Actors who cite secondary sources

In the selected texts, NGOs generally cite secondary sources. These NGOs include *Spire* ("Sprout"), Organic Norway (*Økologisk Norge*), The Future in Our Hands (*Fremtiden i Våre Hender)*, and the Biodynamic Association (*Biologisk-Dynamisk Forening)*. They aim to sway public opinion toward their missions.

Spire calls itself an environment and development organization working for a "fair and sustainable world" through information campaigns and political influence (Spire, 2020). They work with climate, food, trade, and international development, and according to an interview with a Board Member, their members are often university students.

The Future in Our Hands uses awareness-raising campaigns in schools and in public media toward their goal of "global justice, ecological balance, and a solution to the world's poverty problems so… all people on earth [can] live a dignified life" (The Future in Our Hands, n.d.–c). Their issues range from lifestyle choices to investment banking.

According to their website, Organic Norway (2020a) brings farmers, companies, and consumers together. They base agricultural practices on health, nutrition, and quality of life, and care for future generations. They publish the magazine *Ren Mat* ("Pure Food"), which is also included as an actor.

Out of organic farming branches biodynamic farming, which has stricter requirements for its label and folds in spiritual elements of farming practices (Biodynamic Association, n.d.). The Biodynamic Association (n.d.) consists of farmers and supporters aiming for self-sufficient agriculture based on local, renewable resources. One Board Member and farmer was interviewed for this thesis.

5.1.4 Actors whose sources cannot be traced to scientific theorizing

Some actors reference sources not traceable to scientific theorizing. They alluded to books and articles, conversations, unnamed documentaries, "experts," "the internet," "facts," news, podcasts, recipes, and social media. This was common among NNR Public Forum commenters. Interviewees also fell into this category, including a Category and Marketing Director at HOFF. HOFF is a mid-chain actor in the food system, owned by 500 farmers producing potatoes (Hoff, n.d.). HOFF makes potato-based products for grocery, catering, and industry.

Some actors cited personal experience. For example, interviewees cited common knowledge, CSAs and foragers cited farming and foraging experiences, and NGOs cited personal experiences within political parties. According to interviews, the CSA and foraging group communicate primarily on the farm or in the forest. The CSA and foragers' interests include spreading their own local knowledge to their community and, for CSAs, maintaining their business.

Finally, some actors cite sources related to higher education and research, but are not themselves scientific texts. For example, actors cited personal correspondence with researchers and professors, popular media coverage of scientific articles, lessons learned in their study programs, and a university statement. Actors also referred to governmental publications, *Store Norske Leksikon* (the "Great Norwegian Encyclopedia"), and industry, including professional journals and personal correspondence with industry scientists.

The newspapers and magazines use most of the above sources. *Science Norway* covers Norwegian and international research news, often through articles written by and for researchers (Kristiansen, 2020). The articles included in analysis discussed "studies" but did not contain references to scientific publications. Occasionally, they linked to secondary sources, including reports from research institutes.

The rest of the newspapers and magazines at times linked to secondary sources, but mostly referenced sources outside of science. They varied with scope and interest from daily national publications to specialty magazines for industry. Their articles intend to catch attention and gain readership, especially for daily papers and general interest publications such as *Dagavisen* ("The Daily Newspaper"), *Dagbladet* ("The Daily Magazine"), *Dagligvarehandelen* ("The Grocery Store"), *Nationen* ("The Nation"), *E24*, and NRK. NRK is the Norwegian Broadcasting Corporation, the popular public radio, TV, and online service provider owned and funded by the national government through taxes (Enli et al., 2020).

Specialized publications claim specific interests. *FriFagbevegelse* is the Free Trade Union movement's online newspaper covering working life and trade union movements (FriFagbevegelse, 2015). *Energi og Klima* ("Energy and Climate") is the Norwegian Climate Foundation's online newspaper. Its aims to enable "the green shift" by providing knowledge to decision-makers in politics, business, and academia (Energi og Klima, n.d.). *Natt&Dag* ("Night and Day") is a culture magazine throughout Norway (Natt&Dag, n.d.), and *Ren Mat* ("Pure Food"), from Organic Norway, covers sustainability, health, and food (Ren Mat, n.d.–b). According to its website, *NyTid* (n.d.) ("Modern Times") is a quarterly publication with an "eco-anarchist" value system.

Trade publications are aimed at members. *Bondebladet* ("the Farmer's Magazine") is a weekly member newspaper for the Norwegian Farmer's Association following Norwegian agricultural policy (Bondebladet, n.d.). *Baker og Konditor*, the Baker and Confectioner Industry Association's member magazine, is a free publication for members (Fagpressen, n.d.). *Gartneryrket* is the gardening trade magazine (Gartneryrket, n.d.). Finally, *Roede* attracts members to their services, including courses and coaching aiming to shift individual lifestyles to those facilitating a healthy body weight (Roede, n.d.).

5.1.5 Actors who lack references

Finally, some actors offered no reference, including grocery stores, restaurants, and food products. KIWI, *Meny* ("Menu"), Narvesen, and REMA 1000 usually lacked sources, though *Meny* and REMA 1000 provide links for more information on certain certifications (Meny, n.d.–a, n.d.–b; REMA 1000, n.d.–a). However, Coop, a cooperative, cited the UN SDGs, the Convention on International Trade in Endangered Species, and various environmental certification schemes (Coop, n.d.–a, n.d.–b, n.d.–c).

Further, it was difficult to trace actors behind food product packaging. They could include production and marketing companies. They do not communicate their sources behind

messages. Likewise, restaurants did not cite their messages, except the Starbucks in Oslo Central Station. They displayed a sign citing their work with Conservation International's Sustainable Coffee Challenge (see Photo 2, Appendix 7).

5.1.6 Special cases

NorgesGruppen, the largest grocery group in Norway, operates other actors included in this thesis. They own the grocery chains KIWI, *Meny*, Spar, and Joker and operate the brand Eldorado (Ekberg, 2021), creator of one food product analyzed in this thesis. In an interview, a Manager at NorgesGruppen said they conduct focus groups on consumers. This process does not necessarily follow scientific methods nor undergo peer review.

Some actors used nearly every category of reference. The public forum commenters on NNR 2022 offered great diversity in supporting claims, from reference lists with scientific articles to unsupported personal opinions. Nabolagshager included sources from scientific articles through social media.

The EAT Foundation (also called EAT) co-produced basic innovative research and held public events that omit the sources of their claims altogether. Dr. Gunhild Stordalen, a public figure once married to one of the richest people in Norway, Petter Stordalen (Brekke, 2020), is the Founder and Executive Chair (EAT, 2020). In 2019, EAT partnered with a leading medical journal, *The Lancet*, to deliver its Commission on healthy diets from sustainable food systems (Willett et al., 2019). Since then, Dr. Stordalen has been appointed as a Chair of the UN Food Systems Summit (United Nations, 2020). As a result, EAT has a public mandate to build a multistakeholder coalition focused on shifting demand and consumption of healthy, sustainable food and reducing food waste (EAT, 2020).
Ms. Stordalen is a physician and a sustainability advocate involved in several commercial and nonprofit organizations, including her former partner's Nordic Choice Hotel Groups, Scaling Up Nutrition, the World Economic Forum's Global Future Council, Project DrawDown, and

the Stockholm Resilience Center (EAT, 2020; Stordalen Foundation, 2016). With such ties, the EAT Foundation calls itself a "global, non-profit startup" aiming to "[transform] our global food system through sound science, impatient disruption, and novel partnerships" (EAT, 2020). EAT spans multiple categories with diverse interests.

5.2 Food practices for health and sustainability

This section explores the connection between actors' meanings around healthy and sustainable diets and their dietary practices. In 13 of the 15 interviews with selected actors, I asked what factors affect their food choices[6]. Specifically, I asked if these factors include health and sustainability, and if so, how their understanding of these concepts influences their behavior. This section does not investigate if the actors self-report accurately. It is exploratory, serving only to highlight 13 interviewees' perceptions of how their meanings connect to practices.

All 13 actors said health and sustainability were a factor for their dietary practices, but almost all actors included other factors. For example, the Category and Marketing Director at HOFF said health and sustainability are "a part of my criteria." Other criteria include price, availability, taste, and culture. A Project Manager in Oslo Municipality describes choosing healthy and sustainable food as "a problem for the rich." She states that "people who can't really afford it just take what they can get." In this way, price is connected to accessibility.

In the discourse, actors emphasized that sourcing a healthy and sustainable diet is restricted to what is feasibly accessed in one's foodscape. In many accounts, the current food system and daily structuring of practices makes it hard to source healthy and sustainable

[6] In the remaining two interviews, the question was omitted due to time constraints.

diets. A Board Member at *Spire* said "the food system itself… is not made very convenient for people to make healthy and sustainable choices." Further, an intern at EAT stated:

> It's not about the individual's fault. It's the system's fault that we do it this way. So sometimes, I make choices that are probably not defined as the sustainable choice. And I think, you know what, I'm doing work towards the system. I find that long-term that would be more impactful.

In this way, accessibility is about more than what is physically available. Convenience is an important factor for these actors; a person's current practices can restrict their ability to incorporate new food practices for health and sustainability. For example, the Director of Research at Neighborhood Gardens noted that sometimes he was too tired from farming to prepare the vegetables he grew:

> Often times, especially in the summer, I forget to eat the vegetables. I just eat *pølse-lomper* [sausage wrapped in flat bread], you know? I'm so tired from working on the farm that… I just want something fast and quick… It's my partner who has to [say] no, we have to cook vegetables.

In this example, familiar, simple food provides ease. It also considers culture, hinting that in some cases, food provides a familiarity, quickly. More simply, actors noted the importance of taste. As the Category and Marketing Director interview at HOFF describes:

> Both for me and when we develop products, taste is always number one, I think. … Maybe someone can eat it even if it doesn't taste good, but a general portion of people can't just eat it because it's healthy. I think the key is to make something that tastes good and at the same is healthy and good for the environment.

Overall, these actors reported diverse factors directing their dietary practices. Nevertheless, according to the interviewees, health and sustainability were among these factors.

Yet, actors describe a gap between their thoughts and actions. For example, a Gardener at *Løren* Agricultural Cooperative (*Løren Samdyrkelag*) said, "there used to be a very big correlation between my thoughts and ideas and what I actually eat." However, she states that "it has a smaller effect after I got a child, because I'm more tired… and have less time to think and plan."

Even if an actor prioritizes health and sustainability in their dietary practices, they emphasize that their choices differ from day to day. A Researcher in Innovation at Nofima prioritizes health and sustainability but says, “That doesn’t mean I only buy local food directly from the producers. I obviously also go to the supermarket next door for other products.” She also notes that celebrations call for different meals than daily life and describes her eating patterns as “very situational.”

Further, some actors focus on changes in practices influenced by both emotions and information. For example, a Researcher in Innovation at Nofima states, “I'm making informed choices, but I also make emotional choices.” She supports local producers because she “think[s] they need to exist in the future,” but also because “they have very good stories about their products.” Further, the Project Coordinator at Neighborhood Gardens noted that her values changed alongside her food practices. About her time as a competitive athlete, she said, “I was really obsessed about eating enough protein. And now, I think that was so ridiculous.” She used to eat “a lot of meat, all the time,” but now she “can’t even imagine eating a whole steak” for “environmental reasons.” She attributed this change to “realizing that there are more things to the world than just your need for muscle – such a silly thing.” Actors also noted that personal change can affect broader changes.

Actors discussed how their personal changes in diet toward health and sustainability can influence their families, producers, and broader culture. For example, the CEO of Nofima stated that “when you have a 22-year-old who has spent… one year at a farm in Argentina, then you of course get influenced by his dietary preferences.” His son taught him that “you don’t need meat for every meal.” The Category and Marketing Director at HOFF describes the increase of health and sustainability as factors in his industry, saying, “More and more people are thinking a bit more about it.” Regarding food practices toward health and sustainability, he ponders the possibility that “we can have an evolution. Maybe it’s not enough to make a revolution, but it’s getting a little better each year.” Even broader than

consumer influence, a Board Member at *Spire* says that "what is okay to eat" is a matter of culture. Culture, he says, "takes time to change, but we're seeing some changes right now."

Finally, two of the actors seem to prioritize health and sustainability above all other factors in their food practices. When asked if health and sustainability direct her food behaviors, a Project Manager in Oslo Municipality said, "they change my behavior in everything," not just around food. "It's a whole 360 degree look on everything," she said. The Board Member at *Spire* noted that aligning one's practices with what one thinks is best takes "some will to live after your own principles." The Nutritionist at Organic Norway seems to report that he has this quality:

> Recently… I've gotten this deep understanding. Internally, I just feel – I mean, this is what I will eat…. And it doesn't matter how much the food costs, or if it might not be right – I'm just not buying conventional swine, for instance. I'm just not doing it. I'm going to pay a lot more for other kinds of foods.… This might sound a bit esoteric, but when I choose the right foods, when I know that this is something that's going to bring the world in the right direction, it just feels really good to eat it.… I don't care if I'm just one person. It can be good for me, and it can be good for the world.

Even given the challenging social structures, some actors still report prioritizing health and sustainability above all other factors in their dietary practices.

This small sample of self-reported connections between meanings and practices do not prove that shifts in meanings shift practices. However, it hints that messages around healthy and sustainable diets are worth exploring.

5.3 Cross-cutting themes: Levels and linguistics

In analyzing the discourse, I aggregated codes into cross-cutting themes. Using NVivo and mind mapping, themes can be traced to their primary codes and the actors'

original texts. Though I examined the data from the bottom up, I present the prescriptions and claims from the top down, layer by layer.

5.3.1 Levels of dietary change

Indeed, these layers, or levels, are perhaps the most important overarching theme within the discourse. Prescriptions and claims addressed six levels of dietary change to move toward health and sustainability (see Table 2). The emphasis on change comes from the nature of prescriptions and claims. These messages are directional, not merely descriptive; they invoke transition or transformation of food practices toward health and sustainability. The levels are ordered by how the discourse generally frames responsibility for choices at each level. The responsibility ranges from the individual to global.

Table 2 Levels of dietary change addressed in messages. Ordered by levels of responsibility, individual through global, as framed by the discourse. Each level addresses a question, for which an answer from the discourse is provided as an example.

Level of change	**Question addressed**	**Example**	**Framed responsibility**
Diet	What dietary restrictions or intentions should I follow?	"Enjoy a varied diet with lots of vegetables, fruit and berries, whole-grain foods and fish, and limited amounts of processed meat, red meat, salt and sugar" (Norwegian Directorate of Health, 2014).	Individual
Food group	What relative proportions should food groups take up in my diet?	"One of the most important actions you can personally do for the climate is therefore to eat more local vegetables, legumes, fruits and grains. Give the plants more space on the plate!" (The Future in Our Hands, n.d.–b).	Individual, living unit/family
Food item	Within food groups, what food items, with what qualities, should I eat?	"We would also like to address the importance of focusing not only on increased consumption of fruit and vegetables, but explicitly on how to reduce the consumption of animal products by exchanging them with legumes like beans, peas and lentils, plant-based meat substitutes and plant milk products" (NNR Committee, 2020).	Individual, living unit/family
Acquisition site	Where should I acquire my food, and who should my diet support?	"Buy more from your local farmer. If you buy directly from local farmers, such as at REKO-ring or the Farmer's Market, the farmer gets a fair price for the goods and you support the important job the farmer does" (The Future in Our Hands, n.d.–a).	Individual, living unit/family, community, state, international
Production source	What farms, and with what type of agriculture, should my diet support?	"In order to be the most environmentally friendly, you should eat short-distance vegetables which are not grown in greenhouses, Svihus says" (Frøyland, 2020, July 20).	Individual, living unit/family, community, state, international
Awareness of food source, connection to the producers and the Earth	How should my dietary decisions affect, and connect me to, other people and the planet?	"[If people focused on organic eating,] I mean, I think that people would feel happier and feel more meaning and connection with nature and with the world and with each other, and you know, just get the sense that everything is integrated. … I think that's a problem in the Western world that… there's a disconnect between a lot of things around us including nature. And I think it's in nature, that's a good place to start to really connect again." Organic Norway, Nutritionist interview.	Individual, living unit/family, community, state, international, global

The first three levels ask questions focused on the individual. They start with the dietary level. Here, actors address the overall diet, answering the question "what dietary restrictions or intentions should I follow?" This level discusses specific dietary restrictions or intentions, like a vegetarian diet or a balanced diet. On the food group level, actors address the relative proportions of food groups a diet should have. In this thesis, the main food groups

are vegetables, fruits, grains, legumes, nuts and seeds, fish and shellfish, eggs, dairy, and meat, where the first five are plant-based foods and the last four are animal-based foods. Within food groups, the next level addresses which food items should be consumed. This includes choosing certain foods within food groups, like chicken within meat. It also involves choosing specific food products within similar foods, like those with unsaturated instead of saturated fat. In the discourse, the individual, perhaps with their living unit, decides what type of diet to follow, with what proportion of food groups, and consisting of which individual food items.

The next three levels address civic and biosphere realms of the diet, where one comes in closer contact with the socioecological system sourcing their food. First, calls for change in the acquisition site address the question "Where should I acquire my food, and who should my diet support?" Messages on this level distinguish between short-chain systems that connect food to community members and longer-chain food systems with middlemen in between. Next, messages addressing the production source ask what type of agriculture the diet supports and where these farms or fisheries are. More specifically, they make claims or prescriptions about what community, country, or region one's food should come from and by which agricultural standards, such as organic or biodynamic. Finally, prescriptions and claims call for change in the level of awareness of diets' impacts and connection to other people and the Earth. It deals with the question, "How should my dietary decisions affect, and connect me to, other people and the planet?" This level invokes shifts in the spiritual and existential elements relating one's food choices to other humans and the rest of nature. Calls for shifts in awareness, production source, and acquisition site connect the individual's diet to their communities near and far.

Some texts cover various levels within one text. For example, a commenter on the NNR 2022 public forum wrote:

> We would also like to address the importance of focusing not only on increased consumption of fruit and vegetables, but explicitly on how to reduce the consumption of animal products by exchanging them with legumes like beans, peas and lentils, plant-based meat substitutes and plant milk products. (NNR Committee, 2020)

The message to "reduce… animal products" and "exchang[e] them" with legumes and plant-based products calls for adjusting relative proportions of food groups. Within these food groups, the actor suggests which types of legumes to consume, namely "beans, peas and lentils." Plant milk "products" imply a producer exists. This producer could be a person pressing oat milk at home, but perhaps more likely refers to an industrial actor, so implications for where to source or acquire food from are unclear. Overall, the comment points toward a plant-based diet.

Finally, awareness and connection is both the grossest and the subtlest of the levels of change, as it relates both to the broadest connections with the planet and grappling with deeper internal questions. For example, existential questions were raised regarding diets:

> The entire Western way of life must be changed, away from over-consumption that destroys species diversity and ecosystems. We must discover what we have around us. What grows and grows here I live? What is needed for a good life? How can we survive in a crisis? Food and feed can no longer be transported across continents, but must be anchored in local cycles. (Gåsvatn, 2020, July 26)

Questioning what makes for a good life approaches the core question of human needs for health and sustainability. The boundaries between the six levels are fluid, yet still provide structure for the following sections reporting prescriptions and claims.

5.3.2 Linguistics: Prescriptions, claims, and concepts

The other main theme that structures the rest of this chapter involves linguistics. Messages are distinguished into prescriptions and claims based on how strongly the message calls for change. Prescriptions invoke action by using commands; telling what one must, should, or could do; and making suggestions and recommendations. Claims, however, make

statements, more subtly invoking change by describing or implying desirable actions. Finally, concepts illuminate the frameworks behind an actor's prescription or claim. Each text makes a prescription or claim informed by more abstract concepts of health and sustainability.

From actors' text and sub-texts, I elucidate the concepts underlying their messages. Unlike prescriptions and claims, concepts are not usually directional, but descriptive. They do not command or suggest food practices for health or sustainability. In this way, they describe what to strive for, without detailing a path to get there.

In general, concepts of health can be distinguished from concepts of sustainability, and it is usually clear where they overlap. However, claims prove trickier. Claims that frame a food practice as desirable can sometimes be traced back to see if that practice is desirable for health, sustainability, or both, but not always. This may be feasible for future research, but for the scope of this study, I discuss claims for health and sustainability together. Even more so, prescriptions are usually muddled. They tend to follow descriptions of health and sustainability, and the actor could be prescribing a shift in dietary practices for health, sustainability, or both.

5.4 Prescriptions

The discourse analysis revealed that prescriptions vary in their strength. These prescriptions are presented by the level of change they address[7]. The practices they motivate are mapped with those of claims (see Figure 9).

[7] Some prescriptions did not fit clearly into any of the levels. For example, some actors prescribe how one should prepare food, such as avoiding salt at the table. This theme played a minor role in the discourse.

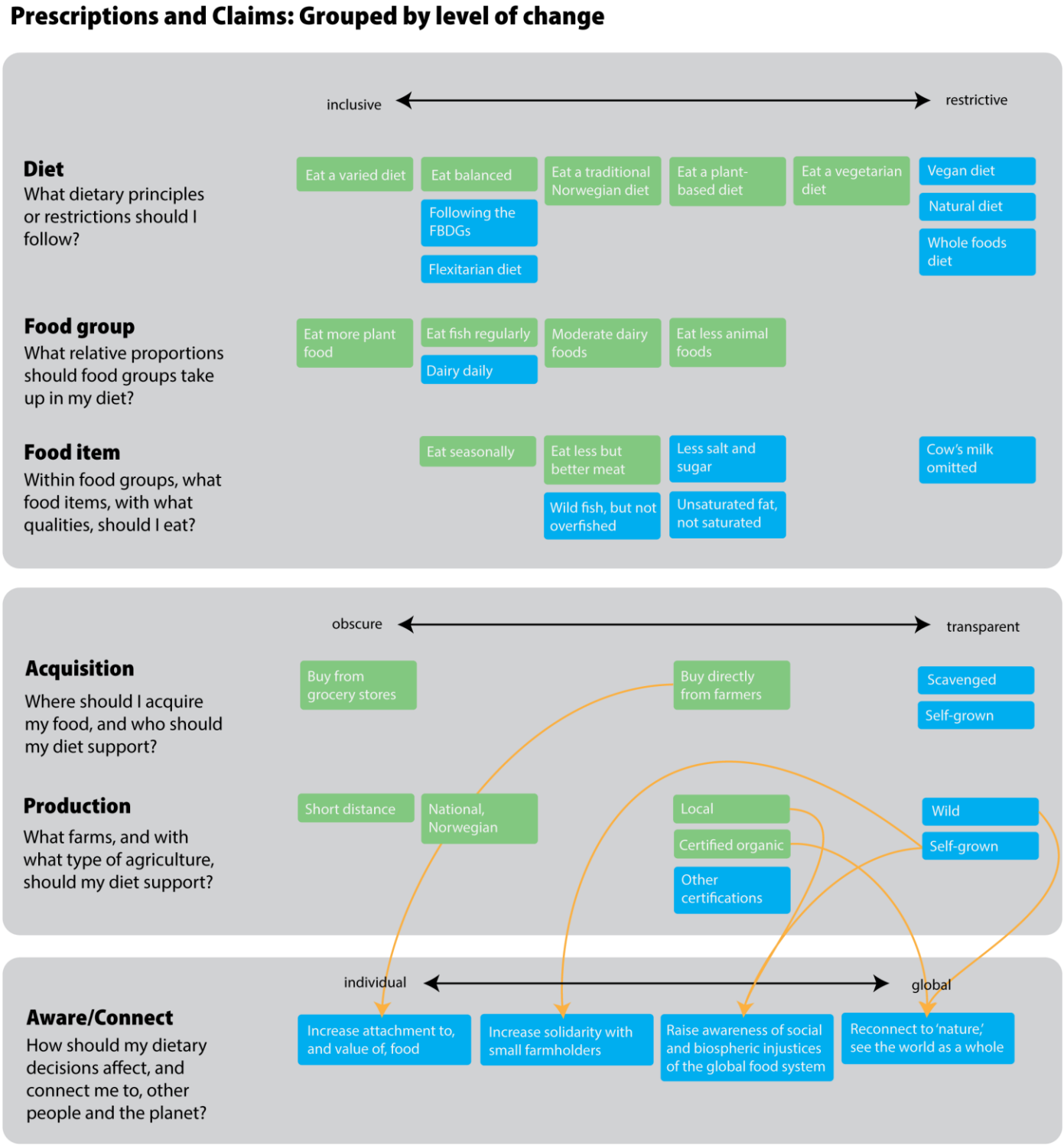

Figure 9 Prescriptions and claims for healthy and sustainable diets from the discourse. Messages are grouped by the level of dietary practice they address. The first three levels are ordered from inclusive to restrictive, left to right. The next two levels are ordered from obscure to transparent, left to right. The aware/connect level is ordered from individual to global impact, left to right. Green boxes indicate prescriptions and claims, and blue boxes indicate claims only. Figure by author, made with Adobe Illustrator.

5.4.1 Linguistics of prescriptions

Prescriptions use various strengths of literary elements to invoke action, ranging from direct commands to suggestions. Commands were the most frequently employed, especially the commands “eat,” “choose,” “replace,” “limit,” and “cut out.” Actors whose interests are concerned with the public good generally commanded with terms that appealed to emotions, such as “enjoy,” “use care,” and “be aware.” Actors in the industry tended toward the command “buy.” The latter frames the eater primarily as a consumer, while the former terms frame the eater more holistically as a person who can feel enjoyment, care for others, and raise their awareness.

Other prescriptions described what one must, should, or could do, aimed at either “we” or “you.” The use of “we” may soften prescriptions and invoke solidarity in the shift. For example, a professor comments in a news article, “it could be more environmentally friendly to change to a vegan diet… however, then we must avoid the tropical fruits” (Frøyland, 2020, July 20). The Future in Our Hands says in a campaign,

> We can still eat meat once in a while, but then we should choose animals that have eaten sustainable feed or are grazed, organic meat, game meat, or meat types that are often thrown away – such as chicken, goat, and sheep. (The Future in Our Hands, n.d.–a)

This example widens the scope of responsibility from the individual to their community, or all people. It also reveals softer types of prescriptions: recommendations, encouragements, and suggestions. Recommendations generally refer to the Norwegian Directorate of Health’s dietary guidelines. Suggestions use the phrasing “could,” “a tip is to,” and “how about,” which motivate action more softly. Ranging from firm commands to softer suggestions, prescriptions appeal to shifts in dietary practices.

It was generally unclear if prescriptions were purported more for health, sustainability, or both equally. However, the current Norwegian Dietary Guidelines present a significant counter-example. This document is framed almost entirely from a health

perspective, and it is dense with prescriptions[8]. Toward the end of the document, sustainability comes into play with a single paragraph, which states that what you eat is important for your health, but also the environment, and that "a more plant-based diet will contribute to reducing the impact on the environment." It is inferred that the previous prescriptions that direct toward a plant-based diet are made on the grounds of human health, not environmental sustainability. Because the NDH guidelines are a significant contributor to this discourse and referenced by other actors, their prescriptions for healthy diets were included with prescriptions for healthy and sustainable diets.

5.4.2 Dietary, food group, and food item levels: Stratified by inclusiveness

On the dietary, food group, and food item levels, messages were variously inclusive and restrictive. On this continuum, more inclusive prescriptions focused on intentions for diets, defining diets positively by what one should eat. On the other hand, some prescriptions focused on what one should not eat, and some strictly restricted certain food groups or foods.

Dietary prescriptions called for eating varied, balanced, traditional, plant-based, and vegetarian diets. Varied diets call for diversity between and within food groups. These prescriptions emphasize variety in vegetables and fruits, but they do not exclude any foods or food groups. Similarly, balanced diets focus on plant food groups (especially whole grains, legumes, nuts, vegetables, and fruits) while regularly folding in animal foods, especially dairy and fish. They generally advocate for limiting red and processed meat, but do not restrict them. However, the call for traditional diets harkens back to the past, where "once upon a time, the water from boiling potatoes was precious" (Renå, 2020, July 17). This prescription calls for making Sunday dinner a special meal worth dressing up for, and otherwise eating

[8] The Norwegian Directorate of Health (2019c) even precisely defines their prescribing terms in their publications. They say that "shall" refers to law or regulation, "should" and "recommend" refer to strong advice applicable to most people, and "can" or "suggest" refer to weaker advice applicable to some, but not all.

"healthy and cheap food like herring and potatoes, tomato soup, and porridge" (Renå, 2020, July 17). This dietary intention restricts food items to traditional Norwegian fare, saying Norwegians should "look to history" for dietary inspiration "rather than becoming vegetarians or vegans" (Renå, 2020, July 17).

Still, traditional diets do not exclude whole food groups, like vegetarian diets. Vegetarian diets call for "[cutting] out meat in favor of vegetables, grains, and fruits" (The Future in Our Hands, n.d.–a). Plant-based diets soften this approach by calling for diets based mostly on plants. They extend the concern from meat to all animal products, but do not purport firm restrictions. Instead, they call for giving "plants more space on the plate" (The Future in Our Hands, n.d.–b). The prescriptions range from inclusive intentions, like varied diets, to more restrictive vegetarian diets.

On the food group level, prescriptions also ranged from inclusive to restrictive. These prescriptions called for shifts in proportions of foods eaten, including eating more plant food, eating fish regularly, moderating dairy foods, and eating less animal foods. To start, prescriptions for more plant foods included eating more berries, fruits, greens, herbs, spices, legumes, nuts, plant oils, plant milk, vegetables, and whole grains. Some prescriptions simply called for eating fish regularly. Finally, actors prescribe reducing animal products, including dairy, meat, and farmed fish (but not eggs). Prescriptions focused on meat, suggesting one prepares meals without meat, uses meat as a topping, and saves meat for special occasions. A newspaper article prescribing "replacing pork chops" with plant-based alternatives says to "take the planet off the grill this summer" (Bogstad, 2020, July 1). It continues:

> If we are to overcome the climate and nature crisis, and at the same time ameliorate both the public health and animal welfare situation, we have to reduce the production and the consumption of meat (Bogstad, 2020, July 1).

Indeed, the most restrictive prescriptions on the food group level addressed animal foods.

On the level of food item, prescriptions focused on eating seasonally and only certain types of meat. Messages relating to seasonality emphasize choosing vegetables and fruits in

their harvest season, usually locally and without greenhouses. Seasonal eating does not restrict against eating out of season or products detached from seasons, like those grown in greenhouses. However, it encourages more seasonal produce. Less inclusively, actors call for eating "less but better meat" (The Future in Our Hands, n.d.–a). Actors describe "better" meat first by the type of animal. For example, prescriptions call for skipping red and processed meat and eating game meat, poultry, or meat that is usually wasted. They also describe better meat by how animals are raised, calling for high animal welfare standards, using organic principles, and keeping cows on pasture. When choosing between items within a food group, prescriptions focused on seasonality and quality of meat.

On the first three levels of change, messages were stratified by their inclusivity. Many prescriptions for healthy and sustainable diets revolved around restricting meat. This was true on a dietary, food group, and food item level.

5.4.3 Acquisition and production levels: Stratified by transparency

Prescriptions on the acquisition and production levels showed a range in transparency. Here, transparency refers to the ability to trace a food back to its farm and agricultural practices. Transparency is framed as essential to knowing the quality of one's food for sustainability and health. On the acquisition level, the actors prescribe buying directly from the farmer at farmer's markets or REKO-rings[9]. They emphasized guaranteeing a fair wage for farmers and witnessing the farms' impact on surrounding ecosystems. Otherwise, some actors prescribed buying from grocery stores – usually the grocers themselves. Prescriptions to buy directly from the farmer focus more on transparent systems than those advocating for shopping in grocery stores.

[9] Andrén-Sandberg (2018) describes REKO-rings as direct sales, usually prearranged through social media, in which farmers meet consumers in a central location to deliver goods out of their vehicle.

At the production level, actors prescribe sourcing food from a short distance, from Norway, from certified organic farms, and locally. At a grocery store, one can purchase foods labeled "Norwegian" without being able to trace which farms and farming practices the foods came from. Still, Norwegian farms must follow national standards, while "short distance" foods do not specify even the country of origin. Thus, Norwegian products were framed as offering more transparency in their production than short-distance foods.

Prescriptions calling for diets based on organic food cite their lack of "synthetic pesticides and artificial fertilizers," which "pay more attention to nature, biodiversity, bees, and a living soil" (The Future in Our Hands, n.d.–a). Organic labels show that the food's producer used organic principles, but they cannot trace a food back to its farm. Farms differ in their adherence to organic principles. In an interview, a Board Member in the Biodynamic Association said that "many organic farms just follow the rules as far as they find it's enough to get the… stamp," and the practices vary within those labeled organic. Finally, purchasing locally can more closely delineate where a product was grown, but not necessarily how, unless one also acquires the product from the farmer and can ask. Thus, local and certified organic are depicted at similar levels of transparency.

Prescriptions at the levels of acquisition and production are often intertwined. For example, actors prescribe purchasing local and Norwegian produce and meat in grocery stores. They also call for deeper levels of locality, including sourcing feed for animals locally and raising awareness for our local surroundings. For example, an article in *Ren Mat* says, "We must discover what we have around us. What grows where I live?" This excerpt alludes to the level of connection and awareness, but it does not prescribe a dietary practice. Only claims addressed this level, and claims are discussed next.

5.5 Claims

Many claims repeated prescribed food practices for healthy and sustainable diets. These claims are not discussed. Instead, this chapter presents claims that add nuance to prescribed practices or introduce new practices.

5.5.1 Linguistics of claims

Claims nudge a behavioral shift by stating, implying, or connoting what is desirable. They invoke change through action verbs like "eat" and directional terms such as "reduced food waste" and "more plant-based diet." Sometimes, they direct responsibility by addressing "you" or "we." Claims nudge toward dietary changes with variable strength.

Most firmly, claims state what practices are good, better, best, wise, important, safe, or otherwise desirable for healthy and sustainable diets. For example, the grocery store *Meny*'s website offers a "guide to more sustainable choices in the store," which says, "a good rule of thumb is to eat varied!" Likewise, the Norwegian Nutrition Council's blog states that "Norwegian-produced fruit, berries and vegetables are beneficial from a sustainability perspective." In these examples, the words "good" and "beneficial" direct the reader toward the desirable action, namely, "eat[ing] varied," and choosing Norwegian produce.

Claims also imply what is desirable. For example, a researcher at Nofima stated in an interview that she is knowledgeable about and works with nutrition and sustainability. She says that that her work "affected very much the way that I eat," and the more she "[works] with sustainability and plant-based foods, the less meat I eat." She avoids explicitly stating that eating less meat is beneficial from a nutrition and sustainability perspective, but she implies so.

More subtly, claims connote desirable practices through cause-effect or part-whole relationships. Some actors simply state the effects of a change in behavior, inviting the reader

to assess these effects as desirable. For example, the NDH's dietary guidelines conclude by stating that "what you eat is not only important for your own health, but also for the environment" and that "reduced food wastage and a more plant-based diet will contribute to reducing the impact on the environment" (Norwegian Directorate of Health, 2014). Here, the cause is "reduced food wastage and a more plant-based diet," with the effect of "reducing the impact on the environment." Since what one eats is framed as "important," the reader can infer that reducing food waste and eating more plant-based is desirable.

Claims can also frame one element as part of a whole, which is in turn framed as desirable. This part-whole framing is called meronymy, in which a meronym denotes a part of its holonym, the whole. For example, a magazine article positions "the global standard for sustainability" as the whole, and gives it meaning by denoting its parts:

> The European Commission wants European food to set the global standard for sustainability. And this is exactly where the EU has a long way to go. Over 50 percent of adults in the EU are overweight, they eat too much red meat, dairy products and eggs, the EU subsidizes environmentally- and climate-damaging agriculture, and over 20 percent of the food produced is thrown away, for starters. In other words, there is great room for improvement here. The strategy… encourages consumers to change their diet to a more plant-based and sustainable diet. But does it hold up? If we want transformative change, then we must stop agriculture that harms health, the climate and the environment. (Måren, 2020, June 10)

The parts of this global standard include "consumers [changing] their diet to a more plant-based and sustainable diet" and "transformative change." Further, the actor defines the whole by what parts it excludes. The text states that "we must stop" the current European food practices, which involve "overweight" communities, eating "too much red meat, dairy products, and eggs," and subsidizing "environmentally- and climate-damaging agriculture." Further, "over 20 percent of the food produced is thrown away," and "agriculture… harms health, the climate and the environment." The semantic relationship between "the global standard for sustainability" and elements of health – "overweight," "harms health" – frames

health as one part sustainability. Whether the claim states, implies, or otherwise outlines what is desirable, it invites the reader to consider changing a dietary practice.

5.5.2 Dietary, food group, and food item levels: Stratified by inclusiveness

On the dietary level, the claims answer the question "what dietary restrictions or intentions should I follow?" Claims on this level support following the Norwegian dietary guidelines and flexitarian diets, which overlap with prescriptions for balanced animal-plant diets. They are considered a subset of balanced diets.

Claims also support restricting diets to vegan, whole, and natural foods. Vegan diets exclude all animal products and restrict against the most food groups. Claims for natural diets are also restrictive. In the discourse, they hearken back to humanity's past, calling for bringing back pre-industrial or even pre-agricultural diets. Similarly, whole food diets restrict processed foods. Whole foods start with whole, raw ingredients. Only simple processing like cutting and cooking are allowed, which excludes concentrates, like oils and juices. Vegan, natural, and whole food diets are more restrictive than the Norwegian dietary guidelines and flexitarian diets.

Within food groups and specific food items, claims respond to the question, "What relative proportions of food groups, consisting of what specific foods, should I eat?" Claims call for eating dairy products daily. They also call for eating more wild fish but less overfished species. Most restrictively, claims emphasize foods with unsaturated fat instead of saturated fat, less salt, and less sugar. Most claims on these levels are restrictive.

5.5.3 Acquisition and production levels: Stratified by transparency

On the level inspiring shifts in the acquisition site, claims addressed the question "where should I acquire my food, and who should my diet support?" The claims called for

scavenging and growing one's own food. A Project Manager at Oslo Municipality said growing food in community is "very see-through," and that more people are growing their own food to ensure certain production practices. Actors supporting scavenging focus on learning about where one's food comes from. A Community Educator organizes workshops for scavenging mushrooms, leaves, flowers, roots, berries, and sap from Oslo's forest. She discusses practices enabling ecosystems to produce edibles for generations. These claims position the eater as responsible for not just consuming food, but also harvesting, producing, and ensuring food for the future.

Claims on the production level address the question "what farms, and with what type of agriculture, should my diet support?" Actors advocate for transparent sources: wild and self-grown. Actors also call for certification schemes. In general, actors framed certification, labelling, and control as guarantees of sustainability. However, as a counter-example, a Board Member of the Biodynamic Association said in an interview that some biodynamic farms "don't care about" the principles and will cut corners for a certification. By this actor's concept of sustainability, creating a diet out of certified products does not necessarily lead to a sustainable diet, and certifications are not a guarantee. Certified foods are plotted as of more obscure origin than wild and self-grown food.

5.5.4 Awareness and connection level

Finally, claims address how one's dietary practices connect one to others and the planet. The claims span from the individual to the global level. For example, a Project Manager at Neighborhood Gardens says that at a farmer's market, one can "actually… see the producer and talk to them." She says that as an individual, this connection makes her value her food more highly and become more "attached" to it. Similarly, growing one's own food is claimed to "increase solidarity" with small-scale farmers (Gåsvatn, 2020, July 26), expanding one's connection from their food to their community. More globally, cultivating

food is claimed to raise awareness of "social and environmental injustices" of the global food system (Gåsvatn, 2020, July 26).

In an interview, a Board Member at the Biodynamic Association said that eating from the land where you live offers an element of balance that eating internationally cannot provide:

> I'm very much convinced that when you eat food grown on the land you live, then the food is supplying you with not only the vitamins and whatever, it's also giving you something from the soil that is in balance for you living there.

This "something" offering balance is framed as "not only the vitamins and whatever," which is interpreted as opposing reductionist views of nutrition and health. I interpret this comment as addressing the intangible connection between humans and ecosystems.

Finally, a Nutritionist at Organic Norway echoed calls for reconnection in an interview. He states his belief that if more people would eat organically, "people would feel… more meaning and connection with nature, with the world, and with each other." He identifies a problem in "the Western world" that "there's a disconnect" between humans and nature. He says that "in nature," one can start to reconnect and "get the sense that everything is integrated." His comments addresses a global level of connectedness and awareness.

5.6 Concepts

The discourse analysis revealed actors' concepts of health and sustainability, and it showed how actors deliver these concepts linguistically. It also revealed their use of other concepts related to health, sustainability, and food.

5.6.1 Concepts of health and sustainability

Key concepts of health and sustainability emerged from the discourse analysis. The discourse illuminates various dimensions of health and sustainability. Actors' concepts of health address dimensions of surviving and thriving (see Table 3). Surviving encompasses physical dimensions to health like having a long life, growing normally, and avoiding disease. Thriving encompasses further dimensions of health, like feeling joy, social health, and feeling connected to nature. Sustainability was discussed in four dimensions: economic, environmental, social, and ethical (see Table 4). Both health and sustainability are addressed at various scales, applying to the individual person, a population, an ecosystem, and the planet. Additionally, health and sustainability are portrayed as temporal and subjective. The discourse analysis revealed overlaps between the concepts of health and sustainability.

Table 3 Codes for concepts of health and unhealth. Health is reported by depth, scale, and qualities of health. Illustrative examples are shown at the primary or first aggregate code.

Second aggregate	**First aggregate**	**Primary code**	**Examples**
No explanation			"Our dream is to make healthy and sustainable food available to everyone" (TUNCO, n.d.).
Dimension of health	Surviving	Avoids disease	"This dietary fiber helps stabilize blood sugar and prevent lifestyle illnesses.… This helps to keep you full longer, lower cholesterol levels, improve bowel function and may even help protect against certain types of cancer" (Editorial Board, 2020, September 7).
		Avoids harmful chemicals	
		Normal growth	
		Long life	
		Lower cholesterol	
		Medically safe	
		Reduced risk of weight gain	
		Stable blood sugar	
	Thriving	Economic health	"A healthy diet is good for your health, and increases the likelihood of experiencing many years with good quality of life" (Coldevin, 2020, September 14). "I think also an important aspect of a healthy diet is that it has to bring you joy, sometimes overlooked. It has to make you happy. Because it's very healthy to be happy." *Løren* Agricultural Cooperative, Gardener interview.
		Environmental health	
		Feeling connected to nature, each other	
		High life quality	
		Joy, guilt-free	
		Precautionary principle	
		Social health	
		Balanced lifestyle	
Scale of health		Planetary	"Transition to a nutrition with less (red) meat and more fruits and vegetables is considered as a major factor for earth health." Public commenter, NNR 2022 public forum (NNR Committee, 2020).
		Ecosystem	"So my beef with conventional food versus organic – it's not that organic food is so much more nutritious, because it isn't, in most ways. But there are some differences…in phytochemicals and the difference in the bacteria, the microbes that live on the food, which can be a healthier ecosystem on the organic food." Organic Norway, Nutritionist interview.
		Population/Community	"If we are to overcome the climate and nature crisis, and at the same time ameliorate both the public health and the situation for the animals, we have to reduce the production and the consumption of meat" (Bogstad, 2020, July 1).
		Individual	"So, one of my strongest concerns, is nothing in life is just one way. There's many ways that things can be done in good ways. We are individuals, we also, in our bodies, we are individuals. I was, for some years, eating vegetarian, but after a while I felt that it's something lacking. So then I bought myself a big sausage." Biodynamic Association, Board Member interview.
Qualities of health		Temporal: now and in the future	"It is wise to limit the amount of cow's milk in children's diets. More than 5 to 6 dl milk per day, yogurt included, is neither suitable nor good for long-term health." *Dagbladet.*
		Subjective	"And again, everyone is different. So - some people say this is healthy and this is not, and the others say the opposite." Oslo Municipality, Project Manager interview.
Concept of unhealth		Death	"The Norwegian Directorate of Health has calculated that… the diet alone is responsible for 8000 deaths every year in Norway. More than half of all deaths of people younger than 75 years are due to noncommunicable diseases, and an unhealthy diet is one of the major risk factors" (Bakke, 2020, October 2).
		Detriments to health (not explained)	
		Disconnection	
		Diseased	
		Harmed (not explained)	
		Overweight, obese	
		Stress	

Table 4 Codes for concepts of sustainability and unsustainability (see Table 4 continued). Sustainability is reported by scale, key elements, qualities, and dimensions. Illustrative examples are shown at the primary or first aggregate code.

Second aggregate	**First aggregate**	**Primary code**	**Examples**
No explanation			"We have an uncompromising focus on sustainability in all we do" (KUMI, n.d.).
Dimensions of sustainability	Economic	Affordable	"Financial sustainability is really a very big piece of the puzzle. What we have seen is that urban agriculture initiatives quite often focused very heavily on the people and the planet piece of the triple bottom line business model and fail to really grasp the profit piece… You have to have the profit piece in place if you want to sustainably implement a business model around the other people and planet." Neighborhood Gardens, Director of Research interview.
		Green growth and industry	
		No exploitation	
		Support livelihoods	
		Withstand costs, competition	
	Environmental	Biodiversity	"One of the main challenges in the Sustainability Agenda itself as presented in the UN Agenda 2030 is that easily measurable units receive too much attention (e.g. carbon) in relation to dimensions of sustainability that are more difficult to quantify (such as biodiversity)" (Måren, 2020, June 27). "Land is a limited resource…. We must therefore think about sustainable land use and land neutrality - that is, if you are going to expand, another place must be built down" (Måren, 2020, June 10).
		Clean air	
		Clean water	
		Low carbon emissions	
		Conserves natural resources	
		Land conversion	
		Nitrogen and Phosphorous	
	Social	Community building	"We work with social aspects of sustainable development in cities.… Our approach to urban agriculture is much more of a place-making approach… [with] community organizing, community engagement, and democratic exchange." Neighborhood Gardens, Director of Research interview.
		Fair working conditions	
		Protects food culture	
	Ethical: Animal welfare		"Today, there are many great plant-based varieties of the typical grilling food, which is not only healthier, but also animal and environmentally friendly. How about replacing pork chops this year, and at the same time give the planet and the animals a better future?" (Bogstad, 2020, July 1).
Scale of sustainability		Planetary	"Organic food production takes care of our soil, insects and planet" (Organic Norway, 2019b). "[Cooperative farming] strives for sustainability at all levels; for the soil, plants, animals, the farmer and consumers" (Organic Norway, 2019a).
		Ecosystem	
		Population/Community	
		Individual	
Qualities of sustainability		Temporal: Now and in the future	"According to the UN, sustainable development means that we must have a consumption covering our needs, but which at the same time does not destroy the planet for future generations and their need for resources" (Frøyland, 2020, July 20).
		Subjective	
Key elements in sustainability's definition		Self-sufficiency	"The National Council for Nutrition has been asked to assess the current national dietary guidelines in a sustainability perspective. In this work, we have used the following assumptions: The Norwegian degree of self-sufficiency should be maintained as a minimum and preferably increase. At the same time, we are part of a global food market from which we cannot and should not isolate ourselves" (National Council for Nutrition, 2017b).
		Circularity, cyclic, regeneration	"Food and feed can no longer be transported across continents, but must be anchored in local cycles" (Gåsvatn, 2020, July 26).
		Long-lasting	"Western, conventional agriculture is not sustainable worldwide. It is too resource-intensive, and therefore reduces the opportunities for future generations to make a living" (Organic Norway, 2019b).

Table 4 continued

Second aggregate	First aggregate	Primary code	Examples
Concept of unsustainable		Inefficient with resources	"In fact, a change towards plant-based foods will be crucial if we want to save our planet from the ongoing climate and nature crisis." Public commenter, NNR 2022 public forum (NNR Committee, 2020). "Farmers and fishermen are left with an ever smaller share… while the owners of the grocery chains become billionaires…. A more sustainable food system is needed." (The Future in Our Hands, n.d.–a)
		Not self-sufficient	
		Vulnerable to collapse, crisis	
		Unbalanced, extreme	
		Socioeconomic inequality, hunger	

Some examples span multiple elements of health or sustainability. For example, *Spire*'s website touches on four planetary boundaries:

> Seaweed cultivation has several properties that facilitate a sustainable blue industry. It requires minimal land and fresh water, and neither pesticides nor fertilizers are applied. Macroalgae absorb nitrogen and phosphorus that are naturally available in the water column. In addition, the macroalgae bind CO_2, which, according to Njåstad, counteracts ocean acidification. (Bazil & Krogstie, 2020)

The quote discusses land-system change ("requires minimal land"), freshwater use, biogeochemical flows ("fertilizers are [not] applied" and "macroalgae absorb nitrogen and phosphorous that are naturally available"), and ocean acidification. As such, it spans dimensions of biospheric sustainability.

In an interview, the Gardener of *Løren* Agricultural Cooperative spans many dimensions and elements of both sustainability and health. She mentions health as surviving, focusing on getting enough "fibers," "vitamins," and "nutrition." She also says a healthy diet "has to bring you joy… because it's very healthy to be happy," touching on the "thriving" code. In the biospheric dimension of sustainability, she notes that one will use "a lot less resources" if they eat plant-based. She mentions four planetary boundaries: "greenhouse gases," "land," "water," and biogeochemical flows of "too much nitrogen" in water bodies. Within these boundaries, she allows for nuance, saying that "different vegetables have different impacts." Recognizing the elements of amount, time, and one's current diet, she states that "most people could eat more vegetables," but "it depends on your starting point."

Her comments span physical and emotional dimensions of health, four dimensions of biophysical sustainability, and the elements of time, amount, and starting point.

Perhaps the comment that most succinctly spans the broadest concepts of health and sustainability came from an interview with a Project Coordinator at Neighborhood Gardens. She said, "I think a healthy and sustainable diet has to take into account all of the aspects, socially, environmentally, and economically, both in the short- and long-term." If health and sustainability have biospheric, social, and economic dimensions considered over time and space, the concepts overlap. This overlap is discussed in the Discussion chapter.

5.6.2 Linguistics of the concepts of health and sustainability

Many actors define health or sustainability negatively, describing what it is not. For example, Organic Norway's website states, "Western, conventional agriculture is not sustainable worldwide," as it is "resource-intensive, and therefore reduces the opportunities for future generations to make a living" (Organic Norway, 2019b). From this example, the reader might know what is not sustainable, namely "resource-intensive" practices that reduce "opportunities for future generations." Perhaps the reader can infer that sustainable practices increase opportunities for future generations to make a living. Yet, the opposite of resource-intensive is unclear: are sustainable practices resource-yielding, resource-efficient, or resource-independent? Actors define concepts negatively, and they also use double negatives.

Some actors show their concept of health or sustainability by defining what its *opposite* is *not.* For example, an article written by the CEO of the Norwegian Dairy Council states:

> The association of doctors and nutritionists on plant-based diets (*Helsepersonell for plantebasert kosthold – HePla*) is constructing an artificial boundary between a healthy diet and dairy products in its chronicle of August 7. This goes against the opinion of most people. (Hauge, 2020, August 25)

HePla is said to create a "boundary between a healthy diet and dairy products." Let us take this to mean *HePla* says *dairy is not part of a healthy diet*. The actor calls this boundary "artificial," implying *it is false that dairy is not part of a healthy diet*. Then, the actor negates again with the phrase "this goes against the opinion of most people." Given the context of the rest of the article, the actor most likely meant that most people do not think a healthy diet excludes dairy. This could mean that most people think healthy diets must contain dairy, that they should, or that they can but do not have to. Actors use layers of negation when describing health and sustainability.

Some actors draw a clear line from their concept to an indicator, then offer food habits to improve that indicator. This same process can be done within a negation. For example, in Photo 3 (see Appendix 7), the Axa Bjørn oats packaging claims the product "contains beta-glucan, a natural fiber from oats, that has been shown to lower blood cholesterol." It says that "blood cholesterol is a risk factor for the development of heart and cardiovascular disease" and that oats are "good for the heart." Here, cardiovascular disease is an element of unhealth, with blood cholesterol as an indicator. Beta-glucan acts as a sub-indicator for promoting healthy blood cholesterol, and because the oats contain beta-glucan, they are marketed as "good for the heart." The reader can clearly trace the food habit (eating oats) to the indicator (consuming beta-glucan and lowering blood cholesterol) and the health advantage (lowering the risk of heart and cardiovascular disease). This example clearly connects a dietary practice to a concept of health through indicators.

However, key elements are omitted, like the amount consumed over time. Oats can be good for the heart, but like any food, oats are unhealthy if overconsumed. Some actors attempt to address the key elements. A vlogger explained to her interviewer (whose words are italicized):

> In general, a healthy diet is much more sustainable than that based on processed foods. And then I promote sustainable foods like beans and lentils. *Give us a fun fact!*
> Two packets of minced meat for the taco is equivalent to 135 cans of beans in CO_2 emissions. So, you can choose, then. (Holljen & Sikko, 2020, September 28)

A clear trail connects the food practice (eating beans) to the indicator (CO_2 emissions) and its sustainability advantage (contributing less to climate change). Further, the actor considers the amount of food, namely "two packets of minced meat" against "135 cans of beans." Still, she does not clearly consider where or how the food was grown, processed, transported, and sold. Further, when prompting the listener to "choose," she does not consider the starting point of their diet. Perhaps one's current diet already integrates sustainability at a deeper level than replacing meat with canned beans. To varying degrees throughout the discourse, actors skipped over elements of time, amount, and place when advocating for change in diets.

Finally, some actors flatten the tiers between a practice, an indicator, and a health or sustainability outcome. In doing so, they fail to logically connect their desirable behavior to the goal of health or sustainability. For example, an article in *Baker og Konditor* states, "If you change to brown or wholewheat bread, whole meal pasta and wholegrain or unpolished rice, you reduce the risk of a premature death by 18%" (Bakke, 2020, October 2). The actor links unhealth to premature death. Without a clearer indicator, it seems their conception of health is simply being alive past the age of premature death. Further, some actors fail to tie sustainability or health to any underlying concept, using the terms without explanation. As illustrated, actors showed their concepts of health and sustainability in variously direct and indirect ways.

5.6.3 Concepts related to health, sustainability, and food

Finally, actors use concepts related to health, sustainability, and food. These concepts include nutrition, healthy food, sustainable food, sustainable production, and sustainable food systems. These concepts show how actors view the sourcing of a healthy and sustainable diet.

Actors portrayed nutrition through holistic and reductionist lenses. Holistic concepts of sustainability focused on "balanced," "diverse," and "resilient" nutrition that is in "equilibrium." Reductionist accounts focused on macronutrients (carbs, proteins, and fats, including fatty acids and omega-3), micronutrients (vitamins and minerals, including calcium and iodine), non-nutrients like fiber, and antioxidants, which can be nutrients or non-nutrients. Reductionist texts indicated healthy nutrition through nutrients and non-nutrients, while holistic framing used diversity and balance as key indicators.

Actors describe qualities of healthy and sustainable food. Healthy food collocates with terms like "clean," "fresh," and "natural." Unhealthy food collocates with phrases such as "toxic," "not fresh," "high calories," and "high fat." Sustainable food is associated with the terms "certified," "controlled," "ethical," "natural," and "traceable." It is also associated with being efficient with resources, affordable, and produced with "care" and "responsibility." Unsustainable food collocates with the terms "chemicals," "industrial," "imports," and "conventional." These examples evoke images rather than outlining clear indicators.

Sustainable food systems focus on the chain between production and consumption. In the discourse, the terms "self-sufficient," "circular," and "social sustainability" are key. Self-sufficiency usually refers to Norway as a nation, but also applies to smaller locales and larger regions. Actors connect circularity to efficiency with natural resources, less packaging, and reduced food waste. Social sustainability collocates with food sovereignty and security, democratic and inclusive processes, fairness, and freedom from exploitation. The discourse focuses on the chain of actors between production and consumption, assessing the system's ability to feed its population, its fairness, and its circularly.

Finally, sustainable production focuses on how the food was grown. Actors discussed sustainable agriculture on fields and in greenhouses, aquaculture in seas and fish farms, meat grown in a laboratory ("lab-cultured" meat), and foraging in forests and seas. In the discourse, sustainable production practices have the general qualities of promoting healthy ecosystems, invoking trust, and using resources efficiently (see Table 5). Some actors outline specific practices, which are grouped by production on land, in water, in the lab, and in the wild. Still, actors use the term "sustainably produced" without explaining it.

Table 5 Codes for concepts associated with sustainable production. Some actors do not explain their use of the concept. Others give general qualities associated with sustainable production. Specific practices mentioned are grouped by practice on land, at sea, in the lab, and in the wild. Illustrative examples are shown at the primary or first aggregate code.

Second aggregate	**First aggregate**	**Primary code**	**Example**
No explanation			"On frozen and pre-packaged fish and seafood products, you can also look for two environmental certifications. MSC guarantees that the fish and seafood products come from sustainable fishing, while ASC guarantees that the products come from sustainable fish and seafood farming" (Meny, n.d.–a).
Qualities	Trustworthy	Responsible	"The operation takes place in a responsible and careful manner that takes care of the environment, both for current and future generations" (Tveten Cooperative Farm, 2020).
		Transparent	
		Certified	
	Promotes…	Biodiversity	"Urban farmers learn that insects are necessary for pollination, that the micro-life in the soil is our best helper and that photosynthesis is the basis for everything that grows. We may also understand some of the unique collaboration between insects, wildflowers and ruminants on pasture" (Gåsvatn, 2020, July 26).
		Clean water, soil, air	
		Stable, healthy, living soil	
	Efficient with resource base	Productive	"Sustainability in food production and consumption is fundamentally about food security for present and future generations. In Norway, with 3% arable land, it is about utilising the national natural resources to produce the food we can, in the most sustainable way." Public Commenter, NNR 2022 Public Forum (NNR Committee, 2020).
		Provides food and nutrition security	
		Self-sufficient with local resources	
		Renewable	
	Balanced		"I'm strongly convinced that biodynamic is one of the best ways of establishing farms in balance. It's one of the most sustainable ways of doing farming." Biodynamic Association, Board Member interview.
	In tune with, protecting nature		"Based on a holistic approach, we believe that food, as far as possible, must be produced on nature's terms" (Ren Mat, n.d.–a).
	Small-scale		"I believe some key words are local production and consumption, mainly plant-based, small-scale, diverse, not mono-culture." *Spire*, Board Member interview.
	Norwegian		"The world has important lessons to learn from the Norwegian agricultural usage, not the least when it comes to animal health" (Klausen, 2020, September 9).
Practices: Land	Avoids	Pollution	"Now the bees are threatened by a global mass death, which is partly due to extensive use of pesticides. For bees and bumblebees, organic farms are a sanctuary without these toxins that they are otherwise exposed to in agriculture" (Organic Norway, 2019b).
		Deforestation	
		Monocultures	
		Pesticides	
		Industrial fertilizers	
	Practices	Animals on pasture	"[Choose] a sustainability challenge: These challenges contribute to sustainable development, even if the climate impact is not as great as the challenges above. [Challenge 1:] Choose organic" (The Future in Our Hands, n.d.–b).
		Biodynamic, organic	
		Crop rotation	
Practices: Sea	Avoids	Overfishing	"WWF has set up a great guide to fish that are not overfished, and that helps you make environmentally friendly choices at the fish counter" (Meny, n.d.–a).
		Copper nets	
		Dyes in fish feed	
	Practices	Organic feed	"[Organic] guarantees that fish are fed with cuts from sustainable fish, or fish that are not used for human consumption, and that other feed is produced organically" (Organic Norway, 2019b).
		Waste fish feed	
Practices: Lab	Use green energy		"If you use green energy in this process it can be more sustainable… You will dramatically reduce the amount of cows from… 1.5 billion or something to… in theory, 150 or so." Nofima, Scientist in Cell-Based Meat interview.
	Use feed for humans instead of cows		
	Reduce water used for raising cows		
Practices: Foraging	Choose abundant species		"If a plant is red-listed… we are afraid that it will disappear. So I will never pick those. Berries, though, I pick a lot… it comes back every year." Foraging Group, Community Educator interview.
	Pick sparsely		
	Pick only parts of plants		

6. Discussion

This chapter discusses the actors and their sources, prescriptions, and claims. It highlights how the discourse confuses the dimensions of, and relationship between, health and sustainability. It argues that a confused discourse led to a constricted space for productive discussion. Then, it offers a framework for conceiving of the health-sustainability nexus and argues that this framework might expand the space for discourse.

6.1 Actors and the sources supporting their messages

The discourse analysis shows that actors support their prescriptions and claims across a spectrum of sources (see Figure 10). Coming from a critical realist paradigm, this thesis sees the actors most closely utilizing the scientific theorizing as potentially more accurately describing healthy and sustainable diets. This is because critical realists recognize scientific theorizing as society's best tool to collectively describe reality (Herborth, 2012).

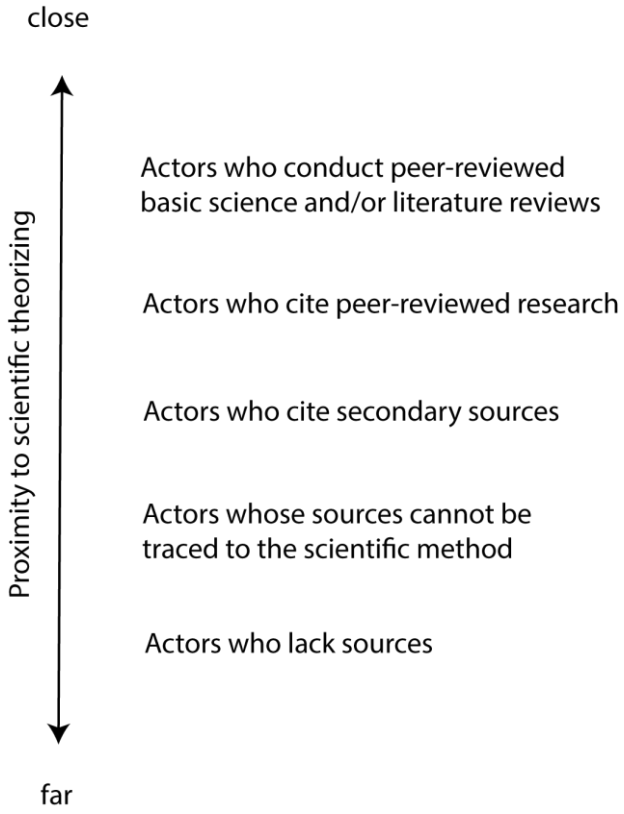

Figure 10 The spectrum of actors' proximity to scientific theorizing, from close to far. The spectrum is based on the sources actors use to support their messages. Figure by author, made with Adobe Illustrator.

Of course, this generalization has caveats. The scientific method itself is a human derivative of reality, filtered through communication, so even sound science is imperfect. Also, actors can intentionally or unintentionally misuse science, and actors can reference scientific publications without basing their messages on them.

As such, not every message worth integrating comes from an actor close to the scientific method. For example, interviewees and public commenters on the NNR forum generally had weaker sources or lacked sources altogether. These genres of texts are casual, and it may be unusual to refer to sources close to the scientific method in such a context. Further, though not following the scientific process, practical experience and local knowledge certainly could be a valuable information source for the public.

Conversely, not every actor using science intends to share quality information. Though actors promote diets based on health and sustainability, these may not be the actors' main interests. Instead, actors may push their interests through these popular agendas. For example, the Starbucks in Oslo Central Station displayed a sign riddled with typos and misspellings, alluding to their work with Conservation International's Sustainable Coffee Challenge. The café's sign said they "joined with man [*sic*] partners in the sectorto [*sic*] make coffee the world's first sustainable agricultural product" (see Photo 2, Appendix 7). A quick web search of Conservation International and their Sustainable Coffee Challenge leads to secondary sources, which link to scientific publications (Conservation International, n.d.). On the spectrum of proximity to scientific theorizing, this example would rank closer to the scientific method than actors whose sources cannot be linked to science and those who lack sources altogether. However, the signage comes across as a careless advertisement. This example shows how actors can refer to sources closer to science with the intention of supporting arguments to satisfy their interests rather than to purport quality knowledge.

Finally, the texts that may most accurately represent reality are by no means those most often encountered by an Oslo resident concerned about healthy and sustainable diets. Perhaps those farthest from the scientific method, like advertisements, could be the most publicly accessible, and even uninvited. This thesis does not attempt to weigh claims based on their influence.

When an Oslo resident encounters a claim for healthy and sustainable diets, awareness of the actors' interests can serve as a first step to filter the message. Then, an actor's proximity to scientific theorizing can help roughly sort actors based on the sources they use to defend their claim. Assessing actors' interests and sources might allow some messages to be questioned or ignored, potentially improving one's navigation of prescriptions and claims in Oslo's foodscape.

6.2 Levels of change in dietary practices

The discourse analysis showed six levels of change. In reviewing them against the literature, I combine the dietary, food group, and food item levels into "food choices," for a total of four levels (see Figure 11). The levels parallel the concept of the three spheres of transformation (O'Brien & Sygna, 2013)[10]. The personal sphere of transformation addresses beliefs, values, worldviews, and paradigms, which aligns with the awareness and connection level. The political sphere relates closely to the acquisition site and production source, as it addresses systems and structures. The practical sphere addressing behaviors aligns with the food choices level, which refers to individuals' dietary practices.

[10] Downs et al. (2017) developed a framework for sustainable diets that aimed to encompass "all the different dimensions of sustainable diets (p. 42)." Their visual representation includes six concentric circles (see Appendix 8). However, Downs et al. (2017) explore 53 "key components" (p. 42) of a sustainable diet. The relationship between these components, within and between levels, remains unclear.

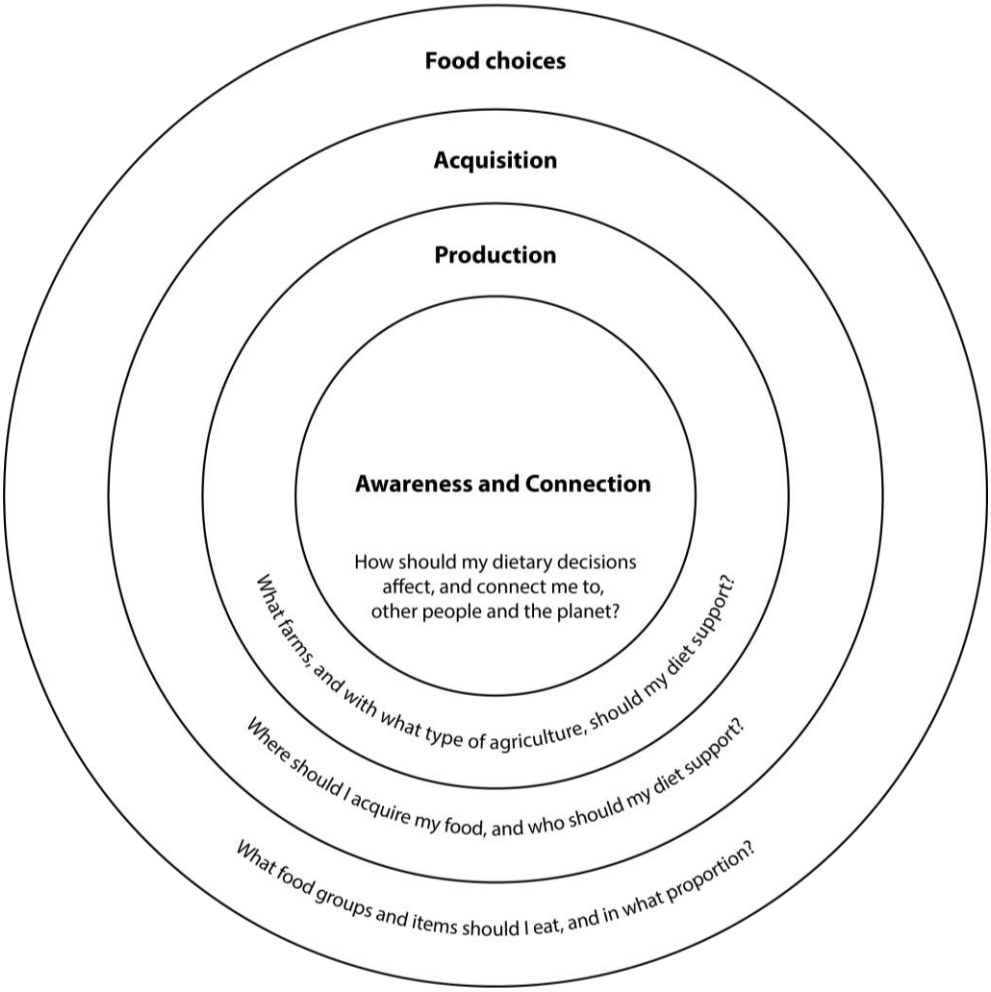

Figure 11 Levels of change in dietary practices with associated questions. Figure by author, made with Adobe Illustrator.

O'Brien and Sygna (2013) situate the practical sphere, addressing behaviors and technical responses, in the center of their concentric circles. However, I place the awareness and connection level at the core. I find that this level most deeply, but also most narrowly, addresses the challenge of moving toward health and sustainability. Conversely, food choices engage with biophysical elements on what is perhaps a shallower level but on a broader scale. In other words, shifting one's diet on the food level is perhaps more accessible and tangibly effective than shifting one's worldview. With this concept in mind, one can put prescriptions and claims into perspective, understanding the breadth and depth of change they address.

6.3 Prescriptions and claims

Overall, claims tended to overlap with prescriptions. However, messages that support a restriction in diets, food groups, and food items, like eating vegan, were delivered with softer language, using claims but not prescriptions. Likewise, calls for supporting transparently-sourced food employ only the softer language of claims. The current average Norwegian diet includes all food groups with many internationally sourced food products (Norwegian Directorate of Health, 2020), which are generally hard to trace. Perhaps this indicates that in this discourse analysis, more extreme shifts from current Norwegian food practices are delivered with softer language.

6.4 Healthy and sustainable diets: The concept and its confusions

Both health and sustainability describe human practices that sustain life on a human and ecosystem level, so some equation between the two is natural. Indeed, the discourse reveals overlaps between health and sustainability. The messages that discuss health on ecosystem and planetary scales overlap with those for biospheric, or "environmental," sustainability. Similarly, messages about social and economic sustainability overlap with concepts of social and economic health. Further, the discourse underlined that for sustainable diets to be long-lasting, they should fuel healthy human lives. In other words, providing for human health is often a prerequisite for sustainable diets in the discourse.

Since its beginning, the concept of sustainable diets included human health (Mason & Lang, 2017, p. 14). Over five decades ago, Frances Moore Lappe wrote *Diet for a Small Planet*, in which she introduced early concepts for a healthy diet which was also respectful of Earth's limits (Burlingame & Derini, 2012). Then, the term "sustainable diet" was coined by

Gussow and Clancy in their 1986 paper, which argued to the nutrition science community that prescriptions for human diets should expand beyond nutrition, including global justice, biological diversity, resource efficiency, and fossil fuel use (Sarlio, 2018, p. 1). Since then, diverse conceptions of a sustainable and healthy diet have emerged. Still, a literature review found that most conceptions of sustainable diets include providing healthy lives for present and future generations (Béné et al., 2019). Overall, health and sustainability are concerned with sustaining life on human and ecosystem scales. Clear overlaps between health and sustainability emerge in the conversation on diets, but the discourse often conflates, flattens, and otherwise confuses the concepts.

The concepts of health and sustainability for diets are often obscured in the discourse analysis. For example, actors use threads of multiple negations to obscure the relationship between health and sustainability. Horn (2010, p. 177) surmises that an actor could use multiple negations when there is an "absence of a corresponding positive." Double negatives in the discourse could show that actors cannot, or will not, clearly define their terms.

Further, changing dietary practices for health and sustainability requires considering time, amount, place, and starting point in the diet. Actors omit these essential elements, describing foods as inherently healthy or sustainable. They describe "healthy food" as "low calorie" and "low fat." Of course, calories and fat are essential for life, and their proportional consumption better determines the health of a diet. Likewise, in an interview, the CEO of Nofima said, "We have a vision of sustainable food for everybody." However, providing "sustainable food" does not consider how much food, how often it is consumed, where the food is produced, or by whom it is consumed. Perhaps the goal could shift to sustainable *diets*, and the target group could be specified. The actors' confusion manifests in obscurity.

Definitions of healthy and sustainable diets in the literature are somehow both ambiguous and narrow. A consortium by the FAO and Bioversity International defined sustainable diets as:

> Those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources (Burlingame & Derini, 2012).

The lengthy definition includes at least 10 components and additional subcomponents, requiring further disaggregation and rendering it impractical (Oliveira Otto et al., 2018). Still, it fails to identify specifically by what measures and at what levels such diets inflict "low environmental impacts." Further, this definition does not frame sustainability as absolute. A sustainable society is not one with "low" impacts; it is one with "low enough" impacts to persist without crossing the Earth's limitations for a safe operating space for humans (Steffen et al., 2015). Finally, it narrowly delineates humans from the biosphere, failing to recognize humans as a meronym of socioecological systems. The definition is ambiguous and narrow, but perhaps such a complex nexus defies a strict definition.

Rather than a definition, Mason and Lang (2017) argue for a more dynamic concept of sustainable diets. Their concept improves upon other frameworks for a healthy and sustainable diet (Gamboni et al., 2012; Padilla et al., 2012), which flatten dimensions of sustainability to one or a few dimensions. For Mason and Lang (2017), sustainable diets include six aspects: food quality, health, environment, socio-cultural values, economy, and governance. Their concept provides breadth that could encompass the complexity of sustainable diets. However, their conceptualization fails to show relationships between the dimensions of health and sustainability, like others (Burlingame & Derini, 2012; Downs et al., 2017; Gamboni et al., 2012; Garnett, 2014; Lairon, 2012; Padilla et al., 2012). The frameworks suggested in the literature do not enable the weighing of factors between and within dimensions, and their ambiguity renders them impractical.

Actors in the discourse also confuse the relationship between health and sustainability. For example, *Meny's* website says:

> Here are 8 tips for those who are concerned with sustainability! … It is often about what is most important to you personally. Is it throwing less, supporting local food producers, choosing foods with a low climate footprint, cutting plastic, thinking about animal welfare or eating healthier? Or maybe everything is just as important.

This excerpt frames "eating healthier" as a meronym of "sustainability." In the literature, human health and sustainability are inconsistently considered prerequisites for each other in diets. In the FAO definition, sustainable diets are "nutritionally adequate, safe and healthy." However, the Global Panel on Agriculture and Food Systems for Nutrition (2016) defines "healthy or high-quality diets" as those which "eliminate hunger, are safe, reduce all forms of malnutrition, promote health and are *produced sustainably i.e. without undermining the environmental basis to generate high-quality diets for future generations*" (p. 32, emphasis added). The literature inconsistently frames health and sustainability as meronyms of each other, resulting in an unclear relationship between the concepts.

The literature also conflates the terms (Drewnowski et al., 2015; Reynolds et al., 2014; Tilman & Clark, 2014). A literature review revealed a narrative equating healthy diets to environmentally sustainable diets. The narrative argues that a more diverse diet provides a wider variety of essential nutrients and minerals (and is therefore healthy) while increasing biodiversity in agricultural landscapes (and is therefore sustainable) (Béné et al., 2019). However, some diets consisting of highly processed "junk" foods ranked higher in diversity than some "high-quality" diets consisting of fish, grains, legumes, fruits, and vegetables (Oliveira Otto et al., 2018). Likewise, highly diverse diets can be sourced from monocrop, industrial agricultural landscapes that pressure ecosystems. This complex relationship is flattened into the mantra that healthy diets are sustainable, and sustainable diets are healthy (Béné et al., 2019). Even more importantly, this example shows how the term sustainability is reduced to one dimension.

Flattening sustainability to one dimension is common through the discourse. Some actors clearly describe the connection between a practice, its measurable outcome for

sustainability, and the related dimension of sustainability. However, many actors flatten tiers connecting practices to the dimension they benefit. In a review of more than 70 studies, Béné et al. (2019) showed a consensus favoring a holistic concept of sustainability, incorporating social equity, an economy promoting human welfare, and "environmental integrity" (p. 123). However, they showed that in research, sustainability is often reduced to one dimension, environmental integrity, which is further reduced to one indicator, often greenhouse gas emissions. In a systematic literature review, 30 components measuring sustainable diets surfaced (Jones et al., 2016). Of these components, greenhouse gas emissions was the most commonly measured, appearing in 63% of the 113 studies (Jones et al., 2016). Almost entirely lacking were indicators for sociocultural factors (Jones et al., 2016). The discourse and the literature favor the biospheric dimension of sustainability, especially focusing on climate change.

Indicators for health do not determine a diet's biospheric sustainability, let alone its economic or social sustainability. Likewise, a sustainable diet by most markers cannot determine a diet's contribution to the dimensions of health. Béné et al. (2019) argue that it is "dangerous" to conflate health with sustainability, flatten narratives, and "promot[e] too broadly win-win scenarios." I argue that confusions constrict the space for productive discussion.

6.5 Constricted space for dialogue

Actors flatten a complex discourse, which can turn the conversation toward finding singular solutions instead of discussing trade-offs and synergies. This flattening often appears as binary framing, in which there is a problem (unsustainable and unhealthy diets) that requires a solution (sustainable and healthy diets). The dialogue is laced with pro/anti

sentiments, which in juxtaposition create dissonance. In interviews, actors describe that dissonance, including a Nutritionist at Organic Norway, who says:

> My… frustration in Organic Norway is that we hear, "there's no sense in organic food because you can't feed the world with organic." And then it kind of stops there. And it's like – then we're done? Really? Is that it?

In his discussions, when organic agriculture is not the silver bullet, the space for dialogue collapses. Likewise, the gardener at *Løren* Agricultural Cooperative expresses the struggle to figure out "what's important" unless one is "really interested" in healthy and sustainable diets. She says that an old message "hangs around after it's changed," and "some messages come through that maybe aren't that important." She states we further flatten those narratives by "[adapting] the things we hear to what we want to hear." Perhaps this over-simplification is natural when the goal is framed as finding a definitive, singular solution.

Searching for a single, all-encompassing solution is associated with pitting camps instead of collaborating in the discourse analysis. For example, an article in *Energi og Klima* reads:

> One of the main challenges in the Sustainability Agenda itself as presented in the UN Agenda 2030 is that easily measurable units receive too much attention (e.g., carbon) in relation to dimensions of sustainability that are more difficult to quantify (such as biodiversity). (Måren, 2020, June 10)

When calling for more complex dialogue, "attention" seems a resource to fight over, with "too much" going to the more measurable units of biospheric sustainability. In a systematic literature review of measurements for sustainable diets, the SDGs relating to the more nebulous social and economic goals were reportedly underrepresented (Jones et al., 2016). Likewise, the CEO of Nofima notices a heavy focus on "environmental sustainability," and draws a line between himself and "the environmentalists," or "them." He says:

> We are very concerned that the sustainability narrative has been captured by the environmentalists and that they tend to only focus on one leg of the sustainability narrative, which is the environmental sustainability, whereas they tend to forget the economic and the social narratives which are important in this whole context.

He also says the environmentalists "captured" the sustainability narrative, which could bring to mind stealing or co-opting from others, furthering the distinction between him and "them." Though the actor seems to call for holistic thinking, he discriminates between himself and those focused on "environmental sustainability" instead of emphasizing their shared goals. Within a flattened narrative, actors sometimes clash instead of facilitating a collaborative, measured discussion toward a global challenge.

Binary framing and searching for singular solutions inhibit actors in this discourse analysis from navigating narratives. This shows in an interview with the CEO of Nofima:

> The claims of the plant-based burgers are… use less water, less energy, less land, and so forth. On the other side, it's highly processed. They use bulking agents, GMO [genetically modified organisms] modified [*sic*] leghemoglobin from soy to get the juiciness into Impossible Burger, and so forth. So is it as good? They have more salt to get the taste. So maybe meat is just as good, a grinded burger, is just as good when it comes to a long-term health perspective.

The actor starts off describing the biospheric sustainability aspects of plant-based burgers as using "less water," "less energy," and "less land." Then, he factors in high processing, "bulking agents," and "more salt," which could refer to biospheric sustainability, but also appear to be health-related. Likewise, it is unclear if "GMO" refers to a health-related or sustainability-related drawback, or both. In the end, the actor struggles to determine if "maybe meat is just as good," as these concepts can understandably seem impossible to compare without a common framework.

Without a clear framework for the health-sustainability nexus, actors cannot make meaningful comparisons of its dimensions. In the systematic literature review, trade-offs and synergies between biospheric indicators were largely undiscussed (Jones et al., 2016). Likewise, a consensus framework for weighing indicators of healthy diets did not arise (Jones et al., 2016). If actors who work with the topics of health and sustainability are unable to productively discuss tradeoffs and synergies, surely the average concerned resident would struggle to navigate these narratives, too.

As counterexamples, two actors manage to productively consider multiple dimensions of health and sustainability as well as multiple approaches toward this nexus. An interview with an Intern at EAT highlights her ability to discuss trade-offs. Specifically, the actor prioritizes the level of connection to the people and ecosystems providing her food above the food groups and items she eats:

> So navigating… to find what I think is the best way – I obviously don't buy those Impossible Burgers or Soy Vegan products. I feel like if I'm going to do that from an environmental, sustainable, fair perspective, then I might as well just buy meat from a small-scale, local producer. I mean, for me, that would be more sustainable in the context that we live in here in Norway, rather than buying soy sausage or chickpeas that have been imported from somewhere in the world.

She implies that though eating plants usually scores better on biospheric accounting than meat, supporting small-scale, local, and fair production more holistically addresses sustainability's dimensions.

Further, both trade-offs and synergies are emphasized in an interview with the Gardener at *Løren* Agricultural Cooperative. The actor considers various elements of biospheric sustainability, stating that eating plant-based will "use a lot less resources," but that "different vegetables have different impacts," with some of them requiring "more water or more land, or have higher greenhouse gas emissions." She also weighs the effect of eating locally, which is "not so important for the climate aspect," but "it makes you more aware," addressing a deeper level of dietary change. Finally, the actor suggests synergies between eating plant-based, eating more vegetables, sourcing diets locally, and increasing awareness of your food's impacts. Underneath her deliberation is a broad but clear conceptualization of sustainability and health. The actors with holistic yet specific frameworks underlying their messages seem to discuss trade-offs and synergies more productively.

6.6 Exploring a framework for the health-sustainability nexus

Much of the confusion around healthy and sustainable diets likely stems from obscure concepts of health and sustainability. This confusion may be cleared with a framework that holds space for the many dimensions of the health-sustainability nexus. The discourse analysis was used as a foundation to explore such a framework. Bolstered with current frameworks in public health, Earth science, and social sciences, the framework outlines needs and limits for human health and a stable Earth system (see Figure 12). The green ring delineates a space where human needs for health and sustainability are met without exceeding biosphere boundaries. The inner ring describes human needs and spans the individual and population level. The outer ring describes boundaries for humanity and spans the ecosystem and planetary level. Together, the shape implies that individual and population needs should be met without disturbing ecosystems and the planet beyond their capacity to sustain humanity.

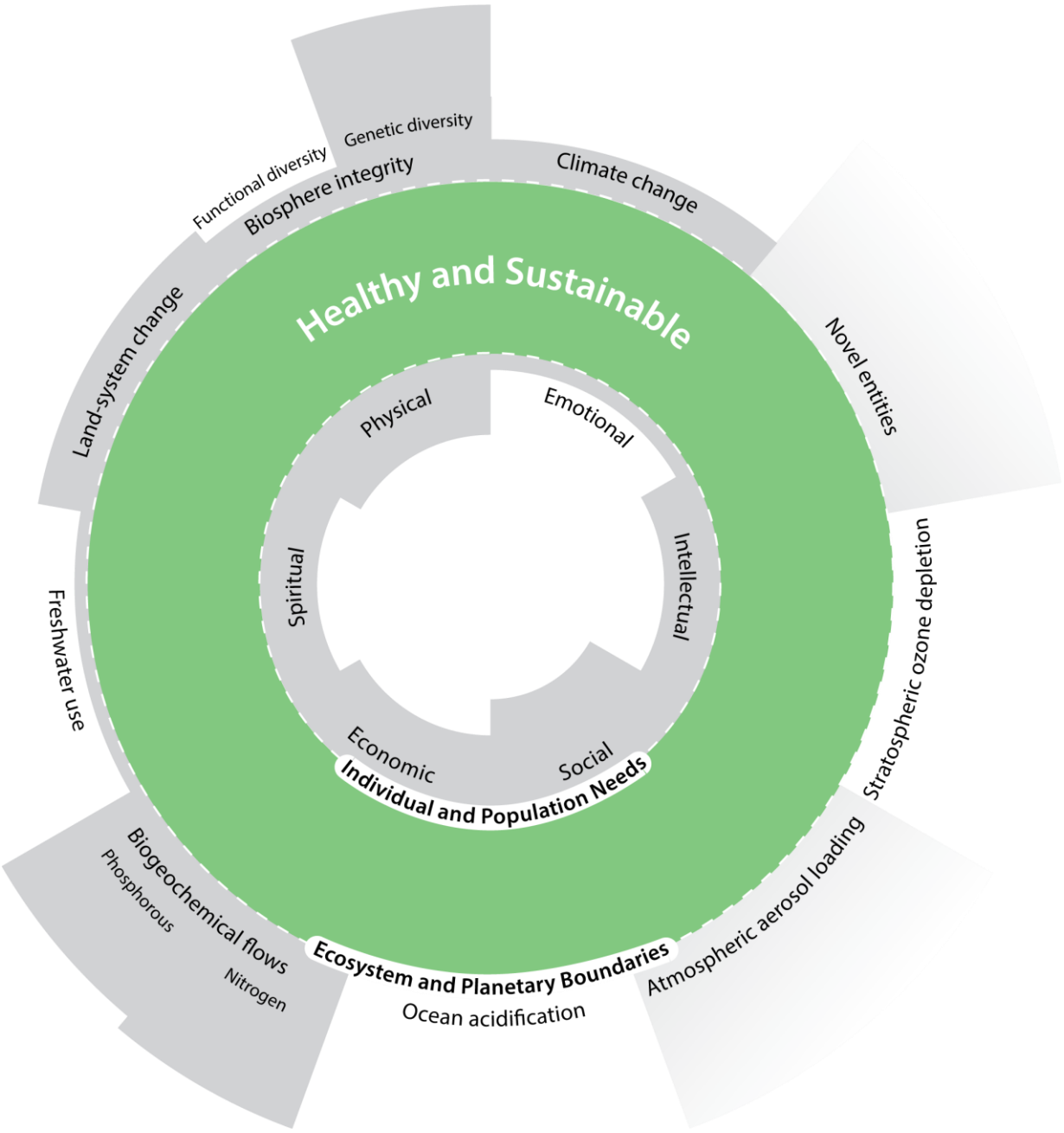

Figure 12 Needs and boundaries for the health-sustainability nexus[11]. Gray wedges represent overshoot of boundaries and shortfall for needs. The inner bars show a hypothetical example for an individual or population. The outer bars are relative to actual planetary boundaries but are not to scale. Atmospheric aerosol loading and novel entities have not yet been quantified. Figure by author, made with Adobe Illustrator.

[11] The dimensions of health and sustainability are nested in nature (see Appendix 9). However, here they are represented in wedges to emphasize minimums and maximums.

The framework for the health-sustainability nexus stems from four frameworks integrated with my discourse analysis. First, biosphere-based sustainability informed my conception of economic and social sustainability as human-only dimensions within the broader biosphere dimension (Folke et al., 2016). This is reflected in naming the inner ring "individual and population needs" and the outer ring "ecosystem and planetary boundaries." The "doughnut for the Anthropocene" (Raworth, 2017) inspired the structure and framing of the health-sustainability nexus as a balance between meeting needs and respecting boundaries, aiming for the safe space between shortfall and overshoot. The needs, then, pertain to humans, while the boundaries pertain to the biosphere. Raworth's (2017) doughnut framework already integrates the planetary boundaries framework (Rockström et al., 2009; Steffen et al., 2015), which I use to delineate dimensions of the health-sustainability nexus at the biosphere level. The dimensions at the human level come from the dimensions of health framework from public health (Park, 2015, pp. 14–16). My discourse analysis informed this health-sustainability nexus.

This framework is supported by my data, with some exceptions. On one hand, from the beginning of this thesis, biopsheric sustainability was conceptualized through the lens of planetary boundaries. This is evidenced by my coding. I coded for biodiversity, clean air, clean water, low carbon emissions, land conversion, and nitrogen and phosphorous. These codes are not identical to planetary boundaries, but they overlap respectively with biosphere integrity, atmospheric aerosol loading, freshwater use, climate change, land use change, and biogeochemical flows. Further, the novel entities boundary relates to the code "using the precautionary principle." Actors prescribing the precautionary principle for genetically modified organisms (GMOs) and combinations of pesticides cited risk in introducing new organisms and materials with unpredictable effects.

However, the discourse analysis did not uncover codes directly related to stratospheric ozone depletion or ocean acidification. Perhaps this is because both boundaries are currently

within the safe operating space (Steffen et al., 2015), and agriculture (here, a proxy for diets) effects these boundaries minorly (Campbell et al., 2017). Though the codes in the discourse analysis did not fill out the planetary boundaries framework, they were diverse enough to legitimize its use in my framework for the health-sustainability nexus.

On the other hand, my codes within the concept of health spurred a search for a framework that fit. Within the concept of health, I coded for "levels of health," including "surviving" and "thriving." In the "surviving" aggregate, the codes included "avoiding disease," "normal growth," "low cholesterol," "stable blood sugar," and "medically safe." These addressed the physical dimension of health. Further, the "thriving" aggregate contained codes for "joy," "social health," "economic health," and "feeling connected to others and nature." These codes aligned with four dimensions of health: emotional, social, economic, and spiritual health, respectively (Park, 2015, pp. 14–16). No actors directly connected the intellectual dimension of health, which deals with cognition, to diets. However, the framework could apply to other practices than dietary, so the intellectual dimension was maintained. On the inner and outer rings, my codes largely fit the framework.

These six dimensions make up the inner ring of human needs. The final dimension, environmental health, was folded in with the outer ring, biosphere boundaries. Further, the codes for economic and social dimensions of sustainability overlapped with economic and social dimensions of health. These codes merge on the inner ring of human needs. Overall, the healthy and sustainable space is where needs are met without surpassing boundaries. Together, the two rings outline needs and boundaries for human practices that enable health and sustainability for individuals, populations, ecosystems, and the planet.

6.7 Limitations of the framework

Future studies could explore connecting the framework (see Figure 12) to the levels of dietary practices explored in this thesis (see Figure 11). At its current development, the framework is not concretely applied to diets through indicators. The questions asked at each level of change could serve as entry points toward this nexus. In other words, they could serve as starting points to generate indicators. These indicators could help understand the effect of practices at each level of change, connecting dietary practices to each dimension of the health-sustainability nexus.

Further development could lead to improvements. This discourse analysis consisted of a small sample size relevant to this spatial and temporal context. One could apply the framework and levels of change concept to further discourses to see if it accommodates their narratives. For example, the Nordic Nutrition Recommendations (NNR) 2022 webinar "Diet and Sustainability" (NNR Committee, 2020) gathered experts from academia and governmental bodies to discuss ways of integrating sustainability into their review, which is the basis of Nordic food-based dietary guidelines (FBDGs). Additionally, the upcoming United Nations Food System Summit includes an action track called "Shifting to Sustainable Consumption Patterns." This group focuses on building demand for "sustainably produced food" and "[improving] nutrition" (United Nations, 2021). Future research could analyze public webinars and their resulting reports.

Further, a systematic review could be performed on frameworks and concepts describing the intersection between health and sustainability. This review need not necessarily be restricted to conversation on diets. This review may highlight areas for revision, contraction, or expansion of the framework and levels of change in dietary practices.

6.8 Potential of the framework

The framework addresses issues within the discourse. Instead of obscuring concepts using multiple negations, the framework positively describes the health-sustainability nexus. When used in tandem with the levels of change concept applied to diets, the two address elements of time, amount, place, and starting point in the diet. It also clearly presents the relationship between health and sustainability as a nexus between human needs and planetary boundaries. This moves away from unclear relationships between and conflation of the two concepts. Finally, the framework avoids flattening this complex nexus into one or a few dimensions. Instead, it is constructed from a range of dimensions of health and sustainability in the literature. If applied, the framework could ameliorate barriers to productive comparison of messages.

For actors in the discourse, comparing messages for health against those for sustainability confounds. The framework integrates various dimensions of this nexus, which may help one see how messages relate to each other, enabling comparison. Further, the framework does not position health on the inner ring and sustainability on the outer ring, contending for consideration. Instead, it delimits needs and boundaries for both health and sustainability. This framing could create space for dialogue for both healthy and sustainable diets, exploring potential mitigation of dissonant prescriptions in a "dietary cacophony" (Godin & Sahakian, 2018). Specifically, it could help actors resist simply equating healthy diets with sustainable diets, instead discussing trade-offs and synergies more dynamically. Instead of pitting camps between actors working on different dimensions, perhaps the framework allows actors to recognize the others' diverse efforts contributing to the same nexus. Further, as individuals with an expanded meaning of the health-sustainability nexus, they may build a capacity for complexity when discussing dietary practices. With a capacity

for complexity, one could contextualize public messages by the dimension they address, perhaps enabling them to better navigate the narratives in their foodscape.

This framework, or one like it, could influence the NNR. The current edition includes an exploratory chapter for sustainability (Nordic Council of Ministers, 2014, pp. 137–154). The chapter mentions social, economic, and cultural dimensions of sustainability, then flattens its discussion to only the "environmental" dimension, which fails to frame humans as a part of the biosphere. Further, the chapter introduces planetary boundaries, then focuses mostly on climate change. The authors begin to discuss synergies and tradeoffs between health and sustainability dimensions. However, this discussion revolves mostly around carbon emissions. From this constricted discussion, the authors conclude that "there are promising possibilities to eat nutritionally adequate and varied diets in a sustainable way" (Nordic Council of Ministers, 2014, p. 147).

The next edition of the NNR is underway. To be published in December 2022, it aims to consider integrating sustainability more centrally in the analysis. The process started in 2019, during which the NNR committee has sought advice from other countries who have included sustainability with various strategies. In a public webinar on September 24, 2020, the NNR committee gathered diverse advice from government officials and scientists.

In the webinar, country representatives and researchers incorporated sustainability into their analysis on healthy diets using four increasingly integrative approaches (van Dooren, 2020). First, some simply added advice and rules for sustainability onto guidelines developed for nutrition. The official governmental FBDGs tended to use this most superficial approach. Less superficially, the second approach focuses on enabling synergies between health and sustainability (van Dooren, 2020). This synergistic approach is used by industry-driven guidelines and institutions supported by governments (Fischer & Garnett, 2016). More deeply, the third approach uses models to optimize various measures of health and sustainability within diets (van Dooren, 2020). So far, most of the modeling has taken place

in an academic or transdisciplinary context and is published in scientific journals, not as public messages. Though efforts to include optimization modeling in FBDGs are underway in the Netherlands and France (van Dooren, 2020), these models include only biospheric indicators (van Dooren, 2020).

The fourth approach incorporates further dimensions of sustainability, positioning the Sustainable Development Goals (SDGs) as the ultimate outcome of FBDGs (van Dooren, 2020). This integrative approach uses theories of change to steer diets toward overall value systems (van Dooren, 2020). Still in the explorative stage, research from the Netherlands advances indicators for such an approach (van Dooren, 2020).

When the NNR 2022 Committee chooses experts on sustainability, their first task will be to develop or select a framework for incorporating sustainability (NNR Committee, 2020). Choosing an integrative approach would embed sustainability more deeply into the analysis than modeling, synergistic, or add-on approaches. Deeply embedding sustainability into analysis may better ameliorate the flattened narrative and constricted space for discussing synergies and tradeoffs.

Instead of using SDGs as the ultimate outcome, the committee could use the framework for the health-sustainability nexus explored in this thesis. Then, the dimensions of health and sustainability would be positioned as a goal for future NNR updates. SDGs may address these dimensions, but they do not show how the dimensions relate. As a result, the committee could select some SDGs to address and exclude others. Conversely, the framework explored here relates the dimensions to each other as parts of a whole, in a nexus. Further, it positions this nexus as an equilibrium between needs and boundaries. In this way, the framework clarifies confusions around health and sustainability. Thus, the committee could use theories of change to steer diets toward value systems.

In choosing theories of change, the committee could consider selecting transformational change, including the spheres of transformation concept. These dovetail

with social practice theory and allow for both emergent and deliberate concepts of change. Through this thesis, the spheres of transformation concept is applied to diets, outlining levels of dietary change (see Figure 11). This could expand the dietary guidelines, which deal mostly with food choices, to include messages directing where to acquire one's food, what types of production to support, and how diets can connect one to others and the planet. These levels could serve as entry points for connecting the framework of the health-sustainability nexus to public messages purporting dietary practices.

This framework could increase the NNR Committee's capacity to discuss synergies and tradeoffs between and within dimensions of health and sustainability. Then, as the NNR 2022 is translated into national FBDGs, public messages could more clearly direct dietary change for health and sustainability. In this way, the framework could ameliorate obscurities, ambiguity, conflations, and otherwise confused concepts of health and sustainability in the public discourse.

6.9 Situating messages within social practice theory and transformational change

For the actors interviewed in this study, dietary practices emerge, are reproduced, and change based on more than their understanding of the health-sustainability nexus. The interviewees reported that factors like price, taste, and convenience influence their dietary practices. Changing dietary practices may require shifting associations between food and price, taste, and convenience. This shift could involve reassociating "good taste" with foods that promote health and sustainability or deprioritizing price and convenience in favor of health and sustainability. Broader shifts in meaning may be necessary, as well as shifts in other elements of practices.

Two actors described an ability to push past dominant practices to be carriers of more healthy and sustainable practices. Likewise, the importance of individual actions is emphasized in an interview with the Editor in Chief of *Ren Mat*:

> Every little decision we make as individuals sends a message to the agriculture community and the political community that we care about what we feed ourselves, and even more importantly, we care about the signal we send to our children and the food we feed our children. Because that's the future.

However, others reported that dominant practices make it hard for average Oslo residents to prioritize healthy and sustainable food, even if they want to. The dietary behaviors they aspire to practice are technically possible given the social structure. However, social practices mediate between these social structures and what actually occurs, or events (Fairclough, 2003, p. 23). Social practices can be seen as ways of controlling which structural possibilities come into being and are retained (Fairclough, 2003, pp. 23–24). For practices to change, other elements may also need to shift, as well as the links between these elements (Shove et al., 2012, p. 21). Perhaps transformative dietary shifts involve changing materials, like the available farms, shops, and foods, as well as the competences, like alternative farming, shopping, and cooking methods. A shift in meaning is part of a complex relationship between shifting social practices and events.

Meanings are just one element of practices. Further, messages in Oslo are just one part of the meanings Oslo residents have around their dietary practices. Still, some actors in this thesis describe that learning about health and sustainability has "definitely" and "completely" impacted their eating practices. Perhaps the NNR 2022 update can be used as an entry point to shift the understanding of the health-sustainability nexus. Further, the committee could use the concepts of transformational change developed here to steer diets toward this nexus. In this way, the committee could affect public messages and, indirectly, the production and reproduction of future dietary practices.

7. Conclusion

This chapter highlights the conceptual and theoretical development contributed by this thesis. It briefly connects each research question to its methods and results. Then, it summarizes the framework for the health-sustainability nexus, and it connects this thesis to the literature's call for transformative change in diets.

7.1 Conceptual and theoretical development

In this thesis, I use discourse analysis to develop the concept of spheres of transformation (O'Brien & Sygna, 2013). Analyzing the discourse illuminated levels of dietary changes purported by actors in public messages. I apply these levels to the spheres of transformation concept, progressing the concept. First, I invert the ordering of the spheres to reflect the breadth and depth of change addressed at each level. I also apply the concept to diets, creating the levels of dietary change concept (see Figure 11). This concept connects each sphere to a category of dietary practices via related questions. In doing so, I introduce nuance to the political sphere, which addresses systems and structures, distinguishing between where one acquires one's food and how the food is produced. Thus, I advance and apply the spheres of transformation concept into levels of dietary change.

The discourse also allowed me to identify mechanisms by which concepts of health and sustainability are confused in the conversation on diets. These mechanisms include multiple negations and omitting elements of time, amount, place, and starting point, which obscure the discussion. Using unspecific terms like “low environmental impacts” results in ambiguous definitions. Concepts restricted to one dimension and one indicator make for narrow conceptualizations. Furthermore, the literature inconsistently describes health and sustainability as meronyms of each other, confusing the relationship between the two. Finally, actors simply conflate the terms into the mantra that a healthy diet is a sustainable diet. Obscured, ambiguous, narrow, conflated, and flattened narratives restrict the space for productive discourse.

These confusions are the result of a constricted discourse and binary framing of a complex problem. As a response, some actors and scholars have searched for singular solutions to a complex challenge. This results in a restricted ability to collaborate and discuss tradeoffs and synergies. The actors, who work with the topic, struggle for productive discourse. Navigating these narratives could understandably confuse and challenge a concerned Oslo resident.

In response, I explore a framework for the health-sustainability nexus that clarifies the dimensions of, and relationship between, health and sustainability. In this way, I contribute to developing a concept of the health-sustainability nexus. I suggest that this framework could alleviate restrictions in comparing dimensions and indicators.

I suggest that the Nordic Nutrition Recommendations (NNR) 2022 Committee uses this framework, or one like it, in their next update. Alongside the framework, I suggest using the levels of dietary change developed in juxtaposition with the spheres of transformation. The resulting messages could prescribe changes in food choices, acquisition, production, and awareness toward the health-sustainability nexus. In this way, a more spacious concept of health and sustainability could be integrated in efforts toward transformation.

As a theory and method, discourse analysis allowed me to focus on a social problem, identify blockages to ameliorating that problem, and question why that problem arose. Quite simply, the social problem explored is unhealthy and unsustainable diets. Blockages to ameliorating this social problem include various mechanisms of confusion in Oslo's public discourse aiming for healthy and sustainable diets and in the supporting literature. I suggest that the problem arose in part through binary thinking and searching for singular solutions.

Then, I was able to develop a possible way past this blockage. I developed a framework for the health-sustainability nexus. I argue that this framework positively defines the dimension of and relationship between health and sustainability; it is specific and broad; and creates space for a diverse discourse. Thus, it could better enable discussions of synergies and tradeoffs within and between dimensions of health and sustainability.

When suggesting that the framework be used alongside the levels of dietary change concept, I suggest using discourse analysis to transform public messages. Further, the process of performing a discourse analysis allowed me to expand my own understanding of the health-sustainability nexus. This process reflects my own deliberate transformation in the personal sphere. Thus, I propose advancements of discourse analysis as a tool for social transformation of worldviews and values. This transformation can occur on the individual level for the researcher performing the discourse analysis. I suggest that it may also occur on the political level if the product of discourse analysis is used to sway public messages.

7.2 Who are the actors and what are their sources?

This thesis analyzed public messages in Oslo that may impact residents' dietary practices. The first research question asked, "What actors put forward messages about healthy and sustainable diets in Oslo's foodscape?" Using actor mapping, the thesis selected actors

purporting prescriptions and claims about healthy and sustainable diets in Oslo. These actors include governmental bodies, non-governmental organizations, research institutes, media outlets, grocery stores, restaurants, mid-chain actors, alternative food producers or harvesters, food products, and commenters on the NNR 2022 public forum.

Then, actors' text containing prescriptions and claims were selected and interviews were conducted. The third research question asked what references actors based their messages upon. Discourse analysis uncovered that actors ranged in their proximity to the scientific method. Some actors conducted peer-reviewed basic research and literature reviews, and some cited peer-reviewed research. Others refer to secondary sources. Further, some actors' sources could not be traced to the scientific method, and some actors lacked sources altogether.

The first and third research questions led to a step one can take when confronted with prescriptions and claims in their foodscape: consider sources upon which actors build their messages. Assessing the proximity of a message to scientific theorizing could help one decide to enact the message's proposed practice, or rather ignore it.

7.3 What dietary practices do actors motivate?

The second research question asked what the actors' messages say and what types of dietary practices they motivate. Using discourse analysis, I separated messages into prescriptions and claims based on the strength of language motivating changes in food practices. These messages support dietary practices on six levels of change. The first three levels fell mostly on the responsibility of the individual. They consist of changes in overall diets, proportions of food groups in the diet, and selection of individual food items.

Changes in practices on these levels variably restrict what one should eat. For example, calls for vegan diets restrict all animal products, while varied diets do not restrict any food groups. The first three levels of dietary practices are associated with broad, biophysical impacts for health and sustainability in the practical sphere of transformation.

The next three levels relate the individual to their socioecological system. Messages on the acquisition and production level motivate changes in where one acquires their food and where and how their food is produced. The practices supported on these levels inspire shifts toward variably transparent food sources. For example, food from grocery stores cannot always be traced back to their farms, unlike food purchased directly from local farmers or grown oneself. The awareness and connection level addresses how one's food connects one to others and the planet. The suggestions variably frame responsibility on the individual to global level. For example, practices can increase an individual's attachment to their food, or practices can raise awareness of social and ecological injustices of the global food system. Changes in practices on the last three levels more narrowly and deeply address dietary change, focusing on the political and personal spheres of transformation.

Through the second research question, the discourse analysis highlighted another step in navigating narratives. One can identify which level of change a proposed dietary practice addresses. Perhaps this can aid in contextualizing practices based on the depth and breadth of their impact.

7.4 What concepts underly actors' messages?

Finally, this thesis questioned what concepts inform and direct actors' messages. The discourse illuminated dimensions and scales of health and sustainability. The scales include the individual, a population, an ecosystem, and the planet. The concept of health overlapped

with the seven dimensions of health from Park (2015, pp. 14–16): physical, emotional, intellectual, social, economic, environmental, and spiritual health. Dimensions of sustainability overlapped with those from Folke et al. (2016): biospheric, social, and economic sustainability. Aggregating dimensions of health and sustainability from the discourse and literature, I explored a framework for the health-sustainability nexus.

The framework outlines needs and limits for human health, a sustainable society, and a stable Earth system (see Figure 12). Health and sustainability occur in a space that satisfies human needs within ecosystem and planetary limitations. Drawing from Raworth (2017) the shape implies that as a part of socioecological systems (Folke et al., 2016), humans must respect the rest of their ecosystem's capacity when sourcing their needs. The framework could accommodate much of the discourse's wide range.

7.5 Responding to the call for transformation of diets

An unhealthy diet is the leading risk factor for deaths worldwide (UN Decade of Action on Nutrition Secretariat, 2016). At the same time, models predict that we have crossed three planetary boundaries set for agriculture: climate change, biodiversity loss, and nitrogen cycling (Willett et al., 2019). A shift in diets has been modeled to reduce pressure on planetary boundaries on a scale that shifting production cannot achieve (Poore & Nemecek, 2018). Past planetary boundaries, the Earth system is modeled to fall into an unstable state inconducive to human societies (Steffen et al., 2015), and Willett et al. (2019) call for transformational change in dietary practices.

This thesis focuses on public prescriptions and claims directing food practices in Oslo's foodscape, with the understanding that shifts in messages can shift associations and classifications that one uses to make sense of the world (Shove et al., 2012, p. 53). Changes

in meaning are part of practices emerging, changing, and fading away (Shove et al., 2012, p. 21). Transforming public messages, like FBDGs, could be a part of changing worldviews, and shifting worldviews could aid in the transformation of dietary practices the literature calls for.

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Appendix 1

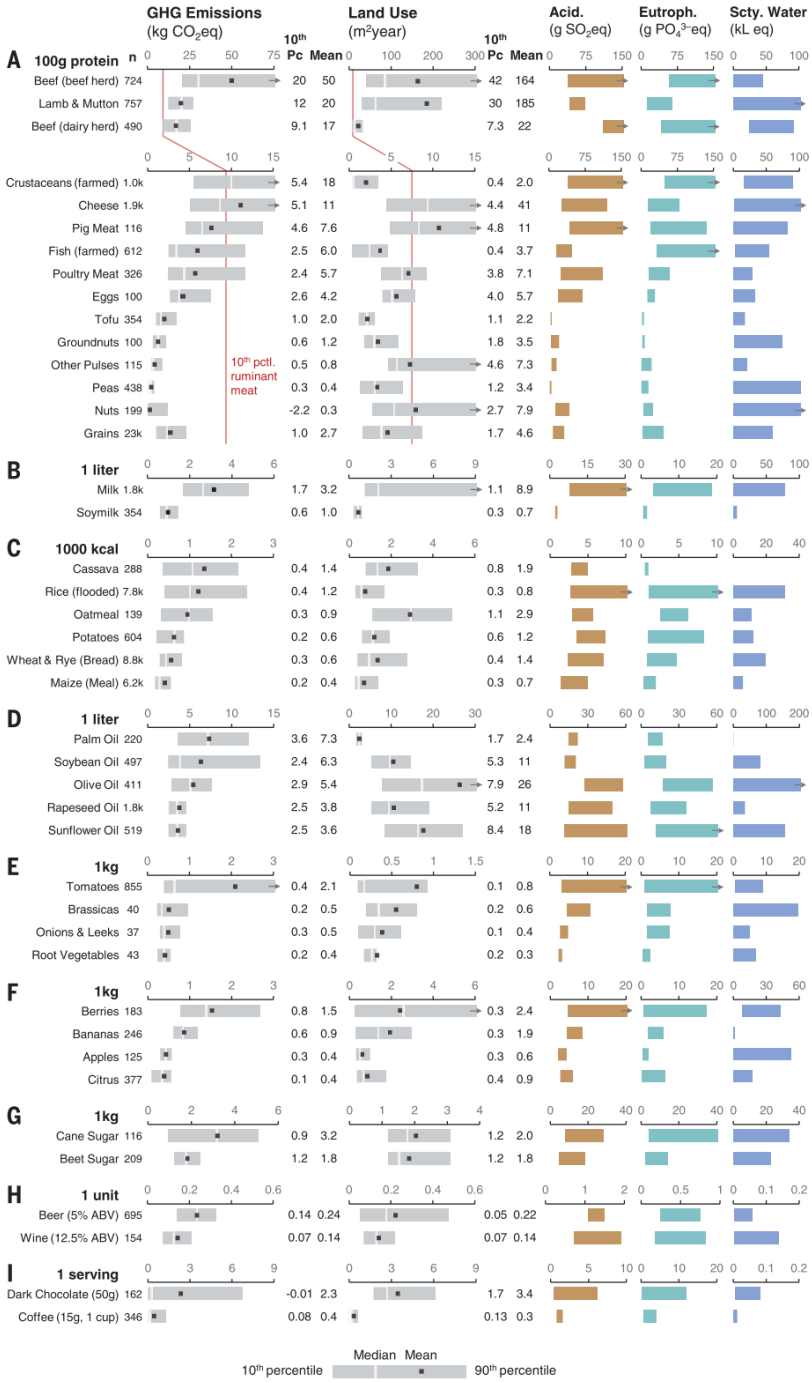

Figure 13 Forty foods and their range of biospheric impacts, compared within food items and against. Modeled impacts include greenhouse gas emissions, land use, terrestrial acidification, eutrophication, and scarcity-weighted freshwater withdrawals. Pc/pctl = percentile, scty = scarcity. Figure from Poore and Nemecek (2018).

Appendix 2

	Macronutrient intake (possible range), g/day	Caloric intake, kcal/day
Whole grains*		
Rice, wheat, corn, and other†	232 (total grains 0–60% of energy)	811
Tubers or starchy vegetables		
Potatoes and cassava	50 (0–100)	39
Vegetables		
All vegetables	300 (200–600)	–
Dark green vegetables	100	23
Red and orange vegetables	100	30
Other vegetables	100	25
Fruits		
All fruit	200 (100–300)	126
Dairy foods		
Whole milk or derivative equivalents (eg, cheese)	250 (0–500)	153
Protein sources‡		
Beef and lamb	7 (0–14)	15
Pork	7 (0–14)	15
Chicken and other poultry	29 (0–58)	62
Eggs	13 (0–25)	19
Fish§	28 (0–100)	40
Legumes		
Dry beans, lentils, and peas*	50 (0–100)	172
Soy foods	25 (0–50)	112
Peanuts	25 (0–75)	142
Tree nuts	25	149
Added fats		
Palm oil	6·8 (0–6·8)	60
Unsaturated oils¶	40 (20–80)	354
Dairy fats (included in milk)	0	0
Lard or tallow‖	5 (0–5)	36
Added sugars		
All sweeteners	31 (0–31)	120

For an individual, an optimal energy intake to maintain a healthy weight will depend on body size and level of physical activity. Processing of foods such as partial hydrogenation of oils, refining of grains, and addition of salt and preservatives can substantially affect health but is not addressed in this table. *Wheat, rice, dry beans, and lentils are dry, raw. †Mix and amount of grains can vary to maintain isocaloric intake. ‡Beef and lamb are exchangeable with pork and vice versa. Chicken and other poultry is exchangeable with eggs, fish, or plant protein sources. Legumes, peanuts, tree nuts, seeds, and soy are interchangeable. §Seafood consist of fish and shellfish (eg, mussels and shrimps) and originate from both capture and from farming. Although seafood is a highly diverse group that contains both animals and plants, the focus of this report is solely on animals. ¶Unsaturated oils are 20% each of olive, soybean, rapeseed, sunflower, and peanut oil. ‖Some lard or tallow are optional in instances when pigs or cattle are consumed.

Table 1: Healthy reference diet, with possible ranges, for an intake of 2500 kcal/day

Figure 14 The EAT-Lancet reference diet, optimized for nutrition. In the 2500 kilocalorie per day (kcal/day) diet, most of the calories from this diet come from whole grains (811 kcal/day), legumes and nuts (575 kcal/day), and oils/lard (450 kcal/day). The reference diet is based on controlled feeding studies with outcomes of intermediate risk factors, observational studies, randomized trials, reviews, meta-analyses, and pooled data. Figure from Willett et al. (2019).

Appendix 3

			Greenhouse-gas emissions (Gt CO_2-eq/yr)	Cropland use (M km^2)	Water use (M km^3)	Nitrogen application (Tg)	Phosphorus application (Tg)	OPTM biodiversity loss (E/MSY)	MAN biodiversity loss (E/MSY)	OPTN biodiversity loss (E/MSY)	NAT biodiversity loss (E/MSY)
Food production boundary			5·0 (4·7–5·4)	13 (11·0–15·0)	2·5 (1·0–4·0)	90 (65·0–140·0)	8 (6·0–16·0)	10 (1–80)	10 (1–80)	10 (1–80)	10 (1–80)
Baseline in 2010			5·2	12·6	1·8	131·8	17·9	100	100	100	100
Production (2050)	Waste (2050)	Diet (2050)	..	..	..	..	..	..	..	..	..
(1)											
BAU	full waste	BAU	9·8	21·1	3·0	199·5	27·5	2	36	153	1067
BAU	full waste	reference	5·0	21·1	3·0	191·4	25·5	2	45	120	1309
BAU	full waste	pescatarian	3·2	20·6	3·0	189·7	25·3	2	46	118	1313
BAU	full waste	vegetarian	3·2	20·8	3·1	186·9	24·7	2	48	122	1374
BAU	full waste	vegan	2·1	20·7	3·3	184·1	24·4	2	50	128	1431
(2)											
BAU	halve waste	BAU	9·2	18·2	2·6	171·0	23·2	1	24	105	716
BAU	halve waste	reference	4·5	18·1	2·6	162·6	21·2	2	32	81	940
BAU	halve waste	pescatarian	2·7	17·6	2·6	160·0	20·8	2	33	78	940
BAU	halve waste	vegetarian	2·7	17·8	2·7	158·5	20·5	2	35	83	1000
BAU	halve waste	vegan	1·7	17·7	2·8	155·0	20·0	2	36	90	1051
(3)											
PROD	full waste	BAU	8·9	14·8	2·2	187·3	25·5	1	7	68	237
PROD	full waste	reference	4·5	14·8	2·2	179·5	24·1	1	14	54	414
PROD	full waste	pescatarian	2·9	14·6	2·2	178·2	24·0	1	15	54	426
PROD	full waste	vegetarian	2·9	14·6	2·2	175·5	23·6	1	15	56	462
PROD	full waste	vegan	2·0	14·4	2·3	172·8	23·4	1	17	59	507
(4)											
PROD	halve waste	BAU	8·3	12·7	1·9	160·1	21·5	0	3	41	103
PROD	halve waste	reference	4·1	12·7	1·9	151·7	20·0	1	9	33	270
PROD	halve waste	pescatarian	2·5	12·4	1·9	149·3	19·8	1	9	34	281
PROD	halve waste	vegetarian	2·5	12·5	1·9	148·0	19·5	1	10	36	317
PROD	halve waste	vegan	1·6	12·3	2·0	144·6	19·2	1	12	40	358
(5)											
PROD+	full waste	BAU	8·7	13·1	2·2	147·6	16·5	1	10	61	292
PROD+	full waste	reference	4·4	12·8	2·1	140·8	15·4	1	14	47	414
PROD+	full waste	pescatarian	2·8	12·4	2·2	139·3	15·3	1	15	46	424
PROD+	full waste	vegetarian	2·8	12·5	2·2	136·6	14·8	1	16	47	456
PROD+	full waste	vegan	1·9	12·3	2·3	133·5	14·4	1	17	49	494
(6)											
PROD+	halve waste	BAU	8·1	11·3	1·9	128·2	14·2	0	7	38	196
PROD+	halve waste	reference	4·0	11·0	1·9	121·3	13·1	0	10	28	290
PROD+	halve waste	pescatarian	2·4	10·6	1·9	118·8	12·9	0	10	27	298
PROD+	halve waste	vegetarian	2·4	10·7	1·9	117·6	12·6	0	11	29	330
PROD+	halve waste	vegan	1·5	10·5	2·0	113·9	12·1	0	12	33	366

Figure 15 Scenarios for shifts in production and consumption with their modeled effect on selected boundaries set for the food system. Scenarios 1-6 increase with ambition. Dark and light green cells are below or within the planetary boundary's range values, respectively. Yellow cells are in the zone of uncertainty, and red cells are in the zone of high risk. Business-as-usual (BAU) refers to following projections based on current trends. PROD and PROD+ improved production practices and a highly ambitious improved production, respectively. Figure from Willett et al. (2019).

Appendix 4

Interview Guide

Can I record?

What is your name and your title?

Tell me a bit about you. What's your background?

My project: Narratives around sustainable and healthy diets in Oslo

How do you define a healthy and sustainable diet?

What information informs your opinion on this?

Where does this information come from?

Do you ever have conversations about this, either through your work, or with friends and family?

How do you feel like your work relates, if at all?

Explain why messages matter: Messages as changing meaning and behavior.

What factors do you consider when sourcing your diet?

How does having a concept of a healthy and sustainable diet direct your behavior? Do sustainability and health affect what you eat and where you get your food?

Appendix 5

Interviews conducted between Monday, October 19, 2020 and Friday, November 6, 2020. Organized by category of actor as in Figure 8.

Research Institutes/Think-Do Tanks

EAT, Intern. Interviewed Saturday, October 31, 2020 by phone for 1 hour and 2 minutes.

Neighborhood Gardens, Project Coordinator. Interviewed Friday, October 30, 2020 by phone for 1 hour and 2 minutes.

Neighborhood Gardens, Director of Research. Interviewed Friday, November 6, 2020 by Microsoft Teams video call for 43 minutes.

Nofima, Researcher in Innovation. Interviewed Wednesday, October 28, 2020 by phone for 32 minutes.

Nofima, CEO. Interviewed Wednesday, October 28, 2020 by Microsoft Teams video call for 40 minutes.

Nofima, Scientist in Cell-Based Meat. Interviewed Monday, October 19, 2020 by Microsoft Teams video call for 29 minutes.

Non-governmental organizations

Biodynamic Association, Board Member. Interviewed Friday, October 23, 2020 by phone for 24 minutes.

Organic Norway, Nutritionist. Interviewed Wednesday, November 4, 2020 by phone for 48 minutes.

Spire, Board Member. Interviewed Tuesday, October 27, 2020 by phone for 34 minutes.

Governmental Body

Oslo Municipality, Project Manager. Interviewed Thursday, October 15, 2020 by phone for 26 minutes.

Alternative Food Producer and Harvester

Løren Agricultural Cooperative (*Løren Samdyrkelag*), Gardener. Interviewed Tuesday, October 20, 2020 by phone for 24 minutes.

Foraging Group, Community Educator. Interviewed Thursday, October 29, 2020 in person for approximately four hours.

Mid-Chain

NorgesGruppen, Manager. Interviewed Tuesday, October 27, 2020 by phone for 35 minutes.

HOFF, Category and Marketing Director. Interviewed Monday, October 26, 2020 by phone for 18 minutes.

Magazine

Ren Mat, Editor in Chief. Interviewed Tuesday, October 27, 2020 by phone for 26 minutes.

Appendix 6

Publications analyzed in the discourse analysis. Organized by category of actor as in Figure 8, then type of text. Citations link to References chapter.

Newspaper articles

Bondebladet – online article	(Bernhoft et al., 2020, September 30)
Dagavisen – online article	(Bogstad, 2020, July 1)
Dagbladet – 2 online articles	(Kalchenko & Johansen, 2020, July 13)
	(Hauge, 2020, August 25)
Dagligvarehandelen – online article	(Editorial Board, 2020, September 7)
E24 – online article	(Rydne, 2020, September 8)
Nationen – 2 online articles	(Gulbrandsen, 2020, 11 September)
	(Klausen, 2020, September 9)
NRK – online article	(Mon, 2020, August 31)
Science Norway – 3 online articles	(Kaste, 2020, September 16)
	(Frøyland, 2020, July 20)
	(Måren, 2020, June 27)

Magazine articles

Baker og Konditor – online article	(Bakke, 2020, October 2)
Energi og Klima – online article	(Måren, 2020, June 10)
FriFagbevegelse – online article	(Renå, 2020, July 17)
Gartneryrket – online article	(Meberg, 2020, June 12)
Natt&Dag – online article	(Holljen & Sikko, 2020, September 28)
NyTid – online article	(Dunker, 2020, June 3)
Ren Mat – online article	(Gåsvatn, 2020, July 26)
Roede – online article	(Coldevin, 2020, September 14)

Magazine website

Ren Mat	(Ren Mat, n.d.–a)

Grocery store websites

Coop – 3 pages	(Coop, n.d.–a)
	(Coop, n.d.–b)
	(Coop, n.d.–c)
KIWI – 1 page	(KIWI, n.d.)
Meny – 3 pages	(Meny, 2018)
	(Meny, n.d.–a)
	(Meny, n.d.–b)
REMA 1000 – 3 pages	(REMA 1000, n.d.–a)
	(REMA 1000, n.d.–b)
	(REMA 1000, n.d.–c)

Restaurant websites

Funky Fresh Foods – 1 page	(Funky Fresh Foods, n.d.)
KUMI – 1 page	(KUMI, n.d.)
TUNCO – 1 page	(TUNCO, n.d.)

Various/unidentifiable: Public forum comments

15 public comments	(NNR Committee, 2020)

CSA website

Tveten Cooperative Farm – 1 page	(Tveten Cooperative Farm, 2020)

(Inter-)Governmental publications

The Norwegian Dietary Guidelines	(Norwegian Directorate of Health, 2014)
National Council for Nutrition blog	(National Council for Nutrition, 2017b)
The Diet in Norway	(NIPH, 2018)
15 responses to public comments	(NNR Committee, 2020)
Nordic Nutrition Recommendations 2012	(Nordic Council of Ministers, 2014)

Non-governmental organization websites

Spire – 1 page	(Bazil & Krogstie, 2020)
Organic Norway – 4 pages	(Organic Norway, 2019a)
	(Organic Norway, 2019b)
	(Organic Norway, 2019c)
	(Organic Norway, 2020b)
The Future in Our Hands	(The Future in Our Hands, n.d.–a)
	(The Future in Our Hands, n.d.–b)

Appendix 7

Text from photos taken in Oslo's foodscape.

Photo 1. Alpro, plant-based milk, product. Photo taken August 28, 2020, at KIWI in Oslo Central.

> Yay! You just did a good thing. Going plant-based is good for you and the planet. So go ahead and reward yourself with a generous splash of tropical sunshine, courtesy of our Coconut drink. Just sit back and enjoy the temptingly tropical taste of coconut – with no added sugars, only what's there naturally. Happy days. Good for you. Good for the planet.

Photo 2. Starbucks, signage. Photo taken August 28, 2020, at Oslo Central Station.

> 99% of our coffee is ethically sourced. We are proud to work with Conservation International to support over one million coffee farmers and workers. Through the Sustainable Coffee Challenge [*sic*] we joined with man [*sic*] partners in the sectorto [*sic*] make coffee the world's first sustainable agricultural product.

Photo 3. AXA BJØRN, lightly cooked oats, product. Photo taken August 28, 2020 at KIWI in Oslo Central. Translated by author.

> AXA BJØRN Lightly Cooked Oats contain beta-glucan, a natural fiber, that has been shown to lower blood cholesterol. High blood cholesterol is a risk factor for the development of cardiovascular disease.

Photo 4. Go Green, couscous, product. Photo taken August 28, 2020 at KIWI in Oslo Central. Translated by author.

> Make way for a greener everyday. Get on the green wagon, a shortcut to simple and good cooking.

Photo 5. Smoothie Exchange, signage. Photo taken August 28, 2020 at Oslo City in Oslo Central.

> "It's all about the açai." We proudly serve açai from Sambazon – the global leader in certified organic and fair trade açai.

Photo 6. Go Vegan, grill sausages, product. Photo taken August 28, 2020 at KIWI in Oslo Central. Translated by author.

> Our sausages are made with sunflower seeds and not with animal, but can be used exactly the same. 100% vegan and free from gluten and soy.

Photo 7. Narvesen, signage. Photo taken August 28, 2020 at Narvesen in Oslo Central. Translated by author.

> Grill weiners – vegan. New! The sausage master.

Photo 8. VegMe, pulled and marinated meal, product. Photo taken August 28, 2020 at KIWI in Oslo Central.

> VegMe. Freshly made vegan. Pulled Marinated Meal. Dairy free, egg free, gluten free, plant-based. Craft vegan food, invented by chefs.

Photo 9. VegMe, chorizo, product. Photo taken August 28, 2020 at KIWI in Oslo Central. Translated by author.

> VegMe. Freshly made vegan. Chorizo. Made with sun flower seeds and pea protein. Dairy free, egg free, plant-based, super tasty. Craft vegan food, invented by chefs. Made with Sunflower and Pea protein.

Photo 10. Bare Bra, Supergranola, product. Photo taken August 28, 2020 at KIWI in Oslo Central. Translated by author.

> Just Fine. Naturally Healthy. Supergranola. Hazel nut and coconut. Without added sugar. Naturally rich in dietary fiber. Less packaging, same contents. Good for the environment.

Appendix 8

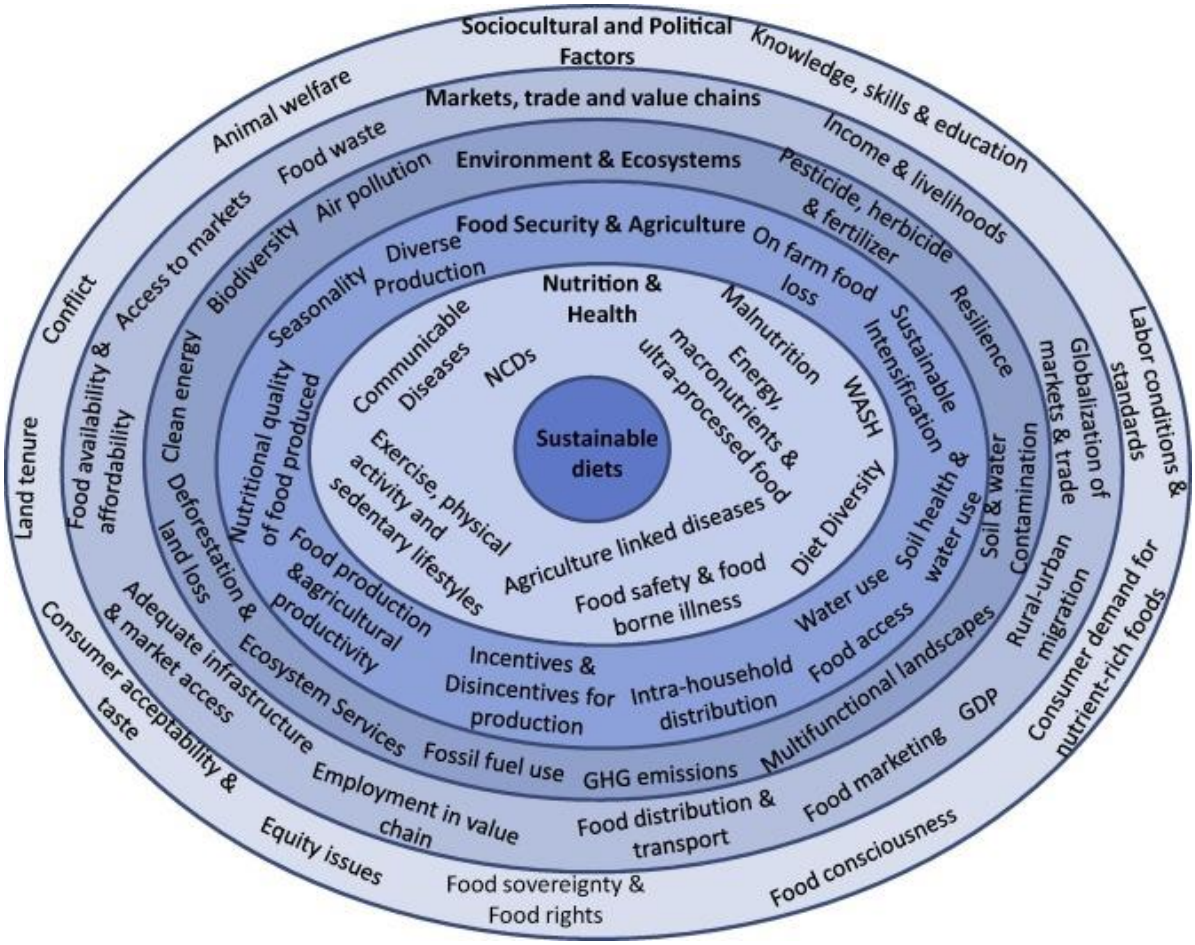

Figure 16 A framework for sustainable diets developed by Downs et al. (2017). Their 53 components cover a breadth of dimensions, though the relationship between indicators and dimensions is not clearly represented.

Appendix 9

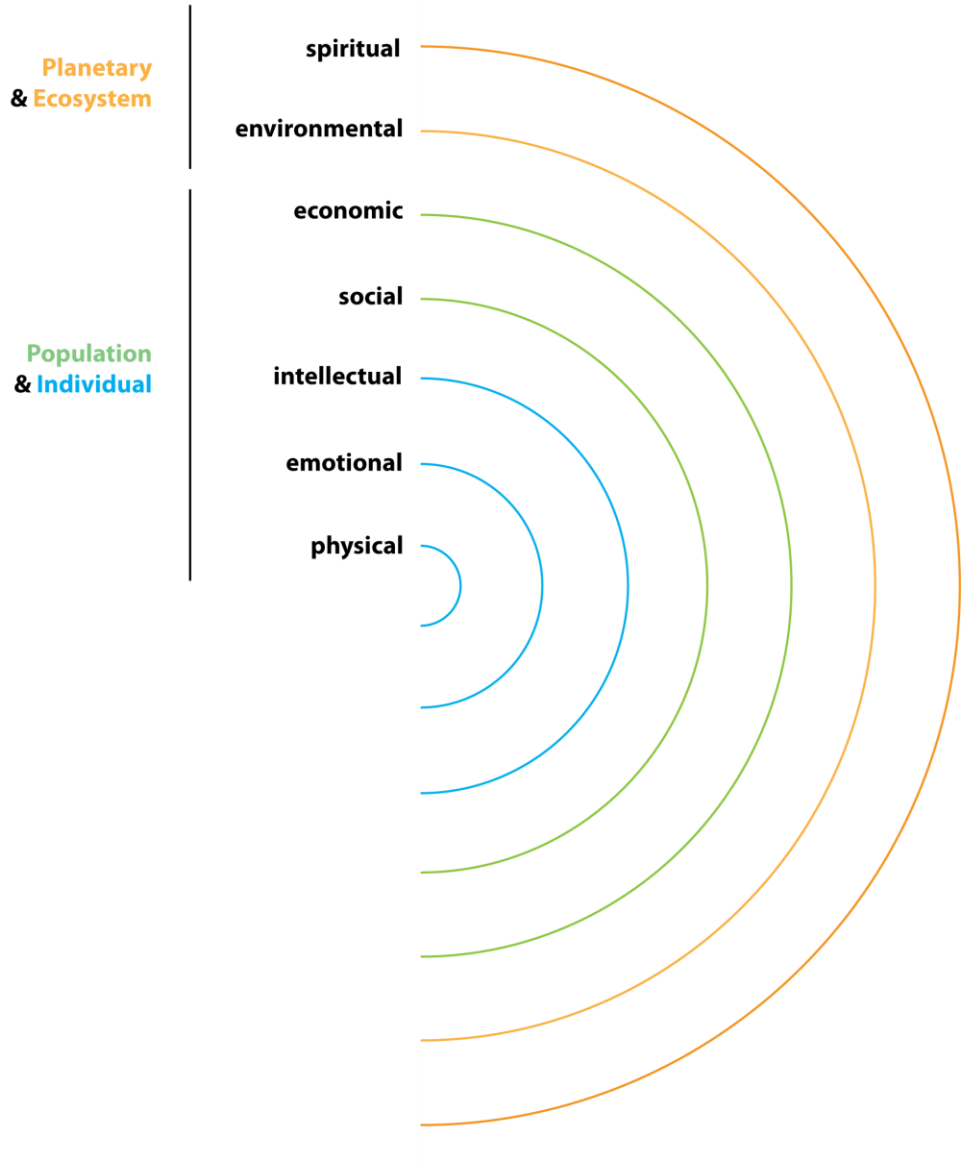

Figure 17 The dimensions of health and sustainability, nested. The levels on the left correspond with the outer and inner rings on the framework of the health-sustainability nexus. Social, economic, and environmental dimensions of sustainability overlap with social, economic, and environmental dimensions of health. Figure by author, made with Adobe Illustrator.

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