

## CHAPTER 7

# Food, Nutrition, and Health in Sápmi

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### 7.1 INTRODUCTION

Last summer, I was approached by a journalist from a large national daily newspaper in Sweden. The editorial team was preparing a series of reports on “the chaos of dietary issues” (In Swedish: “kaos i kostfrågan”), with the aim to mirror popular critique against established dietary advice. The journalist asked me as a “Sami diet expert” to comment on the Nordic nutrition recommendation to decrease intake of red meat for health reasons (Nordic Council of Ministers, 2014). What will compliance with this advice mean for the traditional food culture of Sami? Is it adequate advice also when considering reindeer and game meat? Are Sami people of today scared of eating reindeer meat because of this advice?

At first glance, the journalist’s way of posing these questions provoked me. They seemed yet another mirroring of a colonial perspective overloaded with ignorance and exotification. At second glance however, considering the huge general lack of knowledge about Sami culture among non-Sami, I realized that there is really a great need to elucidate Sami culture in the present from a nutrition epidemiological point of view. This task is urgent independently of the way the questions are formulated and by whom.

### 7.2 BACKGROUND

Sápmi, the traditional Sami homeland, covers northernmost Scandinavia and the Kola Peninsula of Russia (Figure 7.1). In Sápmi, colonialization has occurred within the frames of the national states for hundreds of years. Today Sami are the minority population in Sápmi with few local exceptions, and officially recognized Sami represents less than 5% of the total population (Young & Rawat, 2012), though it has been estimated that between one-fourth and one-third of the gene pool of the Swedish Sápmi is of Sami origin (Nylander & Beckman, 1991).

Sami are sometimes described as the only indigenous population in Europe. Nobody knows the exact number of Sami, but in the electoral registries for the Sami Parliaments in Norway, Sweden, and Finland, there are about 30,000 adults registered. However, official estimates could mean more than three times this figure, assuming a Sami



**Figure 7.1** Sápmi, the Traditional Sami Area Is Not Very Well Defined. The map shows an inclusive version. ©Lena Maria Nilsson.

population of between 80,000 and 115,000 persons, of which 57,500 ( $\pm 7500$ ) live in Norway, 30,000 ( $\pm 10,000$ ) in Sweden, 8000 in Finland, and 2000 in Russia (<https://sweden.se/society/sami-in-sweden>; read October 30, 2017). The Sami language group is divided into three main directions (western, central, and eastern), including nine mutually different languages.

Culture and diet also vary in Sápmi, and not only between different language groups. There are reindeer-herding and non-reindeer-herding Sami. There are hunting and fishing Sami and non-hunting and non-fishing Sami. There are Mountain, Forest, and Sea Sami. In recent years the term City-Sami has been increasingly used to designate Sami with an urban lifestyle and livelihood (Paul & Torill, 2015).

A traditional Sami diet is based mainly on wild plants and animals available in Sápmi (Brustad, Parr, Melhus, & Lund, 2008; Haglin, 1988, 1991; Nilsson et al., 2011). Cloudberries (*Rubus chamaemorus*), lingonberries (*Vaccinium vitis-idaea*), bilberries (*Vaccinium myrtillus*), and plants such as posko (*Angelica archangelica*), jierja (*Mulgedium alpinum*), jomo (*Rumex acetosa* and *Oxyria digyna*), and pine inner bark (*Pinus sylvestris* L.) have been gathered, consumed, and also enhanced in a sustainable way according to Sami traditions (DuBois & Lang, 2013; Rautio, 2014). During the early and mid-1900s, traditional herbs were gradually replaced by cultivated or purchased vegetables (Nilsson et al., 2011) (Picture 7.1).

Lake and river fish have been more important in the traditional Sami diet compared to other reindeer-herding Circumpolar peoples (Kozlov et al., 2008). Various fish are available all year around and often consumed on a daily basis, while reindeer and game meat have a more seasonal consumption. Today, however, fish consumption has substantially decreased and reindeer and game meat is consumed all year around (Nilsson et al., 2011).

The northernmost parts of Sápmi have been described as the “land of no bread” (Kylli, 2014). However, at least since the 1800s, purchases and exchange staples such as coffee (Nilsson, 2014) and flour (Kylli, 2014) have indeed had a nonnegligible position in the Sami cuisine as well as some dairy products, such as butter and coffee cheese (Brustad et al., 2008; Nilsson et al., 2011). Traditional coffee cheese resembles a halloumi without salt and was originally made from reindeer milk. It is consumed together with



**Picture 7.1** The traditional herb posko (*Angelica archangelica*) generally grows close to the water. ©Lena Maria Nilsson.

coffee by cutting it in small cubes and putting it directly into a hot cup of boiled, unfiltered coffee; it is said that “Good coffee-cheese should squeak between your teeth.” Today, reindeer milking has been abandoned, so coffee cheese is made instead from goat and cow milk (Pictures 7.2 and 7.3).

From a micronutrient perspective a traditional Sami diet could be described as a diet rich in fat and protein and poor in carbohydrates and fiber. The diet of Swedish Forest



**Picture 7.2** Coffee cheese is cut in small cubes and put directly into a hot cup of boiled, unfiltered coffee. ©Lena Maria Nilsson.



**Picture 7.3** Open-fire cooking is common in the Sami cuisine. ©Lena Maria Nilsson.

Sami in 1930 has been described as 25–38 E% carbohydrate, 25–32 E% protein, and 40–46 E% fat (Haglin, 1999). In other words, there is a discrepancy between a traditional Sami diet and current dietary recommendations, such as the Nordic (Nordic Council of Ministers, 2014).

Despite all of this, the Sami people are known to be the healthiest indigenous population worldwide (Anderson et al., 2016). In northernmost Sápmi a minor increased risk of angina pectoris, diabetes, and prediabetes, all risk factors for cardiovascular disease, has been observed among Sami in comparison with non-Sami from the same and other regions (Eliassen, Graff-Iversen, Melhus, Lochen, & Broderstad, 2014; Naseribafrouei, Eliassen, Melhus, & Broderstad, 2016). Despite this the life expectancy of Sami people is similar to the Nordic majority population (Sjolander, 2011). A major exception is fatal accidents and suicide; for these the mortality is higher than the national average, especially among young reindeer-herding Sami men (Hassler, Sjolander, Johansson, Gronberg, & Damber, 2004).

Can the relatively good health status of the Sami people to some extent be explained by dietary factors? Nutrition epidemiology studies focusing on traditional Sami dietary patterns as determinants of health are rare (Broderstad, Melhus, Brustad, & Lund, 2011; Haglin, 1999; Nilsson, Winkvist, Brustad, et al., 2012). Somewhat larger in numbers are studies focusing on unique traditional food elements from an implicit or explicit

health perspective (e.g., Bere, 2006; Erkkila, Lichtenstein, Mozaffarian, & Herrington, 2004; Fang, 2015; Hassan, Sandanger, & Brustad, 2012a, 2012b; Mielnik, Rzeszutek, Triumph, & Egeland, 2011; Rautio, Norstedt, & Ostlund, 2013; Samples, 2005; Schwingshackl et al., 2017). Finally, on a macronutrient level, there are a huge number of studies exploring compositions similar to the traditional Sami diet (e.g., Noto, Goto, Tsujimoto, & Noda, 2013). The aim of this chapter is to provide an overview of the present knowledge on the nutritional and health aspects of some significant dietary patterns, macronutrient compositions, and locally produced food groups included in a traditional Sami diet.

### 7.3 A TRADITIONAL SAMI DIET SCORE

Dietary pattern studies may be considered a holistic approach of creating models for healthy eating. In a similar way as score models previously used for exploring health benefits of a Mediterranean dietary pattern, the traditional Sami diet score has been modeled and analyzed in a population-based cohort in northern Sweden (Nilsson, Winkvist, Brustad, et al., 2012).

The model was limited to 65 food items available in the North Sweden Diet Database FFQ (Winkvist et al., 2009), which does not distinguish between the consumption of red meat from high-industrialized cow factories far abroad and locally and ecologically produced reindeer meat, or between cultivated and wild berries. The traditional Sami diet score was calculated by adding one point for each intake above the median level of red meat, fatty fish, total fat, berries, and boiled, unfiltered coffee, and one point for each intake below the median level of vegetables, bread and fiber, all energy-adjusted and calculated separately for men and women, thereby creating a score from 0 to 8 points for each participant. Selection of these food items were mainly based on an interview study with elderly Sami in the same parts of Sápmi as the ones covered by the North Sweden Diet Database FFQ (Nilsson et al., 2011). Participants with 0 points were considered to have a weak adherence to a traditional Sami diet, and participants with 8 points were considered to have a strong adherence.

If there were an association between a high adherence to a traditional Sami diet and the relative health of the Sami people, then no adverse health associations would be found in people with a high score. However, this was not the case in this study. To the contrary a weak increased all-cause mortality was observed in men with higher traditional Sami diet scores and a similar tendency, though not statistically significant, was also observed in women after adjusting for other lifestyle factors (Nilsson, Winkvist, Brustad, et al., 2012).

In conclusion, this model of a traditional Sami diet did not explain the lack of adverse public health status of Sami people compared to the majority population. However, as emphasized by the authors “due to the complexity in defining a ‘traditional Sami’ diet, and the limitations of our questionnaire for this purpose, the study should be considered

exploratory, a first attempt to relate a ‘traditional Sami’ dietary pattern to health endpoints. Further investigation of cohorts with more detailed information on dietary and lifestyle items relevant for traditional Sami culture is warranted.”

## 7.4 A CARBOHYDRATE RESTRICTED DIET

The macronutrient composition of a diet can be modeled by the relative proportion of carbohydrate, protein, and fat content in the diet, and many different scoring methods are used. From a Sami perspective, low-carbohydrate models are the only relevant ones; that is why we will focus on them.

In observational studies, low-carbohydrate dietary patterns are commonly associated with a high intake of animal-based protein and fat and a low intake of fiber and fruits, a dietary pattern with known adverse health effects (Noto et al., 2013). Consequently, in a meta-analysis of four large prospective population-based cohort studies, of which one was from Sápmi, a carbohydrate restricted diet was associated with increased all-cause mortality (Noto et al., 2013).

The study in Sápmi was based on the Västerbotten Intervention Programme in northern Sweden (Nilsson, Winkvist, Eliasson, et al., 2012), where less than 1% of today’s population is recognized as Sami. Compared to the other cohorts included in the meta-analysis, the effect size was weaker in Sápmi (Noto et al., 2013) and actually originally not statistically significant (Nilsson, Winkvist, Eliasson, et al., 2012). The weak association in Sápmi can partly be explained by significant temporal dietary changes in the study population towards an increased intake of fat and a decreased intake of carbohydrates in the early 2000s (Johansson et al., 2012; Mann & Nye, 2009).

Regarding CVD (cardiovascular disease) and cancer mortality and morbidity there is no clear association with carbohydrate-restricted diets (Fung et al., 2010; Nilsson et al., 2013; Noto et al., 2013). Theoretically, a low-carbohydrate, high-protein diet based on vegetable sources would have no major health disadvantages associated with long-term use, though studies supporting this are contradictory (Fung et al., 2010; Nakamura et al., 2014).

In conclusion the macronutrient composition of a traditional Sami diet is likely no explanation for the relative good health status of the Sami people. However, adverse effects of this dietary composition is less pronounced in Sápmi, which means that specific qualities of certain traditional Sami food items might still be beneficial to health.

## 7.5 WILD BERRIES

Plants and plant-based diets are known to reduce the risk of many chronic diseases. Antioxidants, molecules protecting cells from oxidative stress, are assumed to contribute to this risk reduction (Bvenura & Sivakumar, 2017). Compared to other plant foods, wild

Arctic berries included in a traditional Sami diet, such as cloudberry (*R. chamaemorus*), bilberry (*V. myrtillus*), wild raspberry (*R. idaeus*), and lingonberry (*V. vitis-idaea*) are extremely rich in antioxidants (Halvorsen et al., 2002) and may contain five times as high a proportion of antioxidants compared to cultivated vegetables (Bere, 2006). Besides this, wild berries are also a good source of omega-3, and a Norwegian investigation claims that an increased intake of wild berries would improve the diet quality in Nordic countries (Bere, 2006).

Cloudberrries (*R. chamaemorus*) and lingonberries (*V. vitis-idaea*) are both rich in benzoic acid, which protects berries from molding. They were traditionally stored long-term by covering them with cold water in boxes without the addition of sugar. In the 1930s, this was still a common way of storing cloudberrries and lingonberries, though they were commonly boiled with sugar before eating (Nilsson et al., 2011). Bilberries (*V. myrtillus*) and raspberries (*R. idaeus*), which muffled easily, were either dry stored in wooden boxes or mixed and heated with lingonberry to extend the durability of the jam. Today, most berries are eaten as a sweetened jam together with dishes such as porridge, meat, pancakes, and blood or potato dumplings (in Swedish, *palt*). Thus from a nutrition epidemiology point of view the positive health effects of eating berries may likely be countered by the adverse health effects of eating sugar-sweetened food (Pictures 7.4 and 7.5).



**Picture 7.4** Lingonberries (*Vaccinium vitis-idaea*) are preserved by covering with boiled and cooled fresh water. ©Lena Maria Nilsson.



**Picture 7.5** Arctic char prepared as a restaurant dish. ©Lena Maria Nilsson.

## 7.6 WILD PLANTS

From a scientific perspective, wild plants in Sápmi are mainly explored as medical herbs, not as food staples. Posko (*A. archangelica*), for example, includes substances with antiviral effects on herpes simplex virus-1 and Cocksackievirus B3 infections (Rajtar et al., 2017). Besides antiviral and antibacterial properties, extracts from foreign posko species has also been demonstrated to be anti-inflammatory and inhibit tumor growth and metabolic syndrome (Kil, Pham, Seo, & Jafari, 2017). The Jierja species from the Mongolian area (*M. tatarica*) has been shown to include anticarcinogenic substances (Ren, Zhou, Chen, & Ye, 2005). Jomo (*R. acetosa* and *O. digyna*), promoted in recent years as keystone herb in the New Nordic diet, has been explored from a food safety perspective. A maximum intake of 50g fresh jomo per day will not have any adverse health effects (Mithril & Dragsted, 2012).

Pine inner bark deserves specific attention. The Sami practice is to harvest it in early summer, when the starch content is at its peak and the content of bitter-tasting substances is low; it has an energy density of approximately 286 kcal/100 g dry weight. Carbohydrates dominate and the sugar content may be up to 8 g/100 g dry weight. Pine inner bark also contains 6.5 g fat/100 g dry weigh, predominantly mono- or polyunsaturated. The main minerals are calcium and potassium (Rautio et al., 2013). It has also been suggested that the antioxidant and anti-inflammatory effect of the phenols (more than 26 different) may be beneficial for health (Rautio, 2014). In conclusion, it appears to be a nutritious food item deserving further attention.



## 7.7 FISH

Worldwide, fish consumption has been proven as a core element of healthy eating (Schwingshackl et al., 2017). In Sápmi and other Circumpolar areas, fatty fish is of specific importance, because low solar radiation means insufficient conditions for cutaneous production of vitamin D (Grant, Juzeniene, & Moan, 2011). Other advantageous components of fish are omega-3 fatty acids associated with cardiovascular health, unique fish proteins improving insulin sensitivity, B vitamins, and trace elements such as selenium and iodine. In comparison with mammal meat, fish meat has a relatively high protein/fat ratio, which is positive from a healthy eating aspect (Wallin, Orsini, Forouhi, & Wolk, 2018).

However, when larger amounts of fish are consumed, the presence of environmental contaminants must also be taken into account (Domingo, 2016). In Sápmi, the Gulf of Bothnia fish stock is particularly prone to contamination by dioxin, PCB, and mercury. Gulf of Bothnia fish can still be consumed locally because of a permanent exemption from European standards, but the National Food Agency of Sweden (In Swedish, *livsmedelsverket*) discourages consumption of locally caught fish more than three times per week. It is recommended that fertile women and children eat even less of the local fish. As a consequence of this the Swedish and Finnish parts of Sápmi are not self-sufficient on safe fish (Nilsson & Evengård, 2015). A risk-benefit analysis of population-based data from Swedish Sápmi and Finland has shown that the positive effects of eating fish may be more important for the cardiovascular health than the disadvantage of exposure to methylmercury (Wennberg et al., 2012).

## 7.8 REINDEER AND GAME MEAT

Reindeer and game meat could, at least to some extent, be considered red meat; that is, meat with red-colored raw muscle tissue. Red meat is generally described as a lean food item that includes all essential amino acids in a good mix for humans, and it is an important source of vitamin B12, niacin, vitamin B6, iron, zinc, and phosphorus (Williams, 2007). Compared to beef, lamb, mutton, pork, and chicken meat, reindeer meat contains higher vitamin B12, iron, zinc and selenium concentrations (Hassan et al., 2012b). It also has darker color than beef, higher iron content, and a higher glycolytic potential (Rincker et al., 2006). Another advantage compared to beef is the relative high content of polyunsaturated fatty acids (Hassan et al., 2012a).

Despite all the nutritious advantages of red meat in general and reindeer meat in specifically, there is strong and consistent evidence that a high consumption of red meat is associated with a shorter life expectancy (Schwingshackl et al., 2017) and an increased cardiovascular disease and cancer risk (Yip, Lam, & Fielding, 2017). The reason for this is not fully known, but oxidative stress and inflammation as a metabolic response to the

consumption of red meat have been suggested as a plausible mechanisms involved (Chiang & Quek, 2017).

Nutrition epidemiology studies differing between the consumption of different kinds of red meat, such as traditional (e.g. reindeer and game) and industrial (e.g., beef, lamb, and mutton) are rare. In a small study from Kautokeino a higher intake of reindeer and game meat was associated with higher levels of both blood cholesterol, which is a cardiovascular risk factor, and glycerophospholipids, which may attenuate the cholesterol effect (Igl et al., 2013). Another study observed a better iron status among Sami in the Norwegian inland who likely consume large amounts of reindeer meat compared to non-Sami from the inland and Sami and non-Sami from the coastland (Broderstad, Melhus, & Lund, 2007).

Animal fat, blood, and organ dishes also deserves attention. In the traditional Sami diet, all edible parts of the animal were utilized. However, to the best of my knowledge, there are no complete nutrition epidemiological descriptions of reindeer blood and organ dishes, except measures of vitamins and selected nutrients in reindeer liver, tallow, and marrow bone (Hassan et al., 2012a, 2012b).

## 7.9 DAIRY PRODUCTS

In Nordic countries a majority of the population is lactose and milk tolerant and therefore perceives no adverse health effects from the consumption of milk. Worldwide, dairy products appear evidentially as nutritious foods and are not associated with any major health threats (Mullie, Pizot, & Autier, 2016; Thorning et al., 2016). However, among Sami and other Circumpolar indigenous people a tissue type (HLA-B27) associated with milk protein intolerance is rather common (Johansson, Ingman, Mack, Erlich, & Gyllensten, 2008; Peschken & Esdaile, 1999). Actually, one-fourth of the Sami and one-sixth of the majority population in Sápmi are carriers of this tissue type, which is also associated with several autoimmune diseases (Bjelle, Cedergren, & Dahlqvist, 1982; Johnsen, Mahonen, & Lunde, 2009; Peschken & Esdaile, 1999). In carriers of HLA-B27, milk protein may trigger a low-grade (so-called silent) inflammation in the intestinal tract. Consequently a study in northernmost Sápmi revealed that stomach pain from milk consumption was twice as common among Sami compared to non-Sami people (Hansen, Brustad, & Johnsen, 2015). Further, in a recent population-based prospective cohort study from southern Sápmi, intakes of nonfermented milk and butter were associated with higher mortality, while intakes of fermented milk and cheese were associated with lower mortality (Tognon et al., 2017).

## 7.10 SAMI CUISINE AND PREPARATION TECHNIQUE

From a gourmet perspective the Sami cuisine has received increased attention, and descriptions and cookbooks are now available even for an English-speaking audience

(e.g., Harnesk, 2015). However, since the focus of this chapter is food, nutrition and health, I will not put an effort on describing the gourmet dimension of the Sami cuisine. Preservation and preparation techniques, however, may have a non-negligible health impact; thus these aspects of the Sami cuisine deserves some specific attention.

Food preservation techniques of importance in the Sami cuisine includes drying, water-covering, cooling, freezing, salting, and sweetening. Food preparation techniques include boiling, smoking, frying, and open-fire high-temperature heating.

Drying is one of the oldest food preservation methods worldwide, allowing seasonal food to be consumed all year round. In general, drying reduces the content of water soluble vitamins, especially vitamin C, in food but increases the fiber content and the energy density (Devi, 2015). In general, most of the nutrients in meat are also preserved by drying (Devi, 2015; Jimenez-Colmenero, Ventanas, & Toldra, 2010).

Before the introduction of modern freezers, berries with a low content of benzoic acid, such as bilberries (*V. myrtillus*) and raspberries (*R. idaeus*), were mainly preserved by drying. Lingonberries (*Vaccinium vitis-idaea*) and cloudberries (*R. chamaemorus*) were preserved by covering them with fresh cool water in bottles or other storage receptacles. In an old cookbook from 1931, this is described according to the following:

“Mature cloudberries are cleaned and rinsed carefully, after which they are put into well-cleaned bottles. Boiled and cooled water is poured over the berries to cover them, after which the bottles are tightly closed. Store in a cool but frost-free basement.”

From a health perspective, both of these methods are advantageous compared to sugar sweetening. There is convincing evidence that the consumption of dried grapes, and to some extent also dried black currants, improves the metabolic status of persons with type 2 diabetes (Hernandez-Alonso, Camacho-Barcia, Bullo, & Salas-Salvado, 2017). This is likely also the case of traditional berries in Sápmi.

Dry-cured meat (e.g., reindeer and game) or fish is another common dish in Sami cuisine. Traditionally, after the autumn-winter season (*in Sami Tjaktjadálvve*) slaughter, the meat is kept frozen in an unheated storage. In the spring-winter season (*in Sami Giddá-dálvve*), when the sun is back and before the flies arrive, the meat (and freshly caught fish) is lightly salted and dried outdoors in the sun. Dried meat is eaten as backpack food or a snack, as well as together with coffee. Properly prepared, dried meat may be considered a sustainable and healthy food (Picture 7.6).

Some meat and fish, both fresh and dried, is also flavored by smoke-curing, a culture predominantly applied among the Mountain Sami, according to interviews with elderly Forest Sami (Nilsson et al., 2011). Smoke curing means aggregating of polycyclic aromatic hydrocarbons, a group of environmental contaminants, which are known to be a potential health threat for humans (Kuhn, Nowak, Behnke, Seidel, & Lampen, 2009).

This is also the case for food and coffee heated over an open fire (high temperature heating). Why this practice together with smoke curing may be seen as some less healthy items of the traditional Sami cuisine. In fact the relatively high prevalence of stomach cancer among Sami could be explained by the high consumption of smoke-cured



**Picture 7.6** Dried meat is consumed as backpack food or snacks. ©Lena Maria Nilsson.

meat (Hassler, Sjolander, Gronberg, Johansson, & Damber, 2008; Soinen, Jarvinen, & Pukkala, 2002).

In traditional Sami cuisine, boiling is the dominant food preparation method, more common than frying. Sharing a meal of boiled reindeer meat, including marrow bones and blood dumplings, is considered a festive event (Nilsson et al., 2011). Sometimes lean reindeer meat is prefried for a short while, before boiled in a bouillon. Fish is rarely fried before boiling. Compared to frying, boiling is generally considered a healthier food practice, preserving more of the nutrient content of the food, and avoiding heat related contaminants such as the already mentioned polycyclic aromatic hydrocarbons also related to smoke curing and high-temperature open-fire heating. In addition, if the meat or fish bullion is eaten or drunk, vitamins and nutrients dissolved in the water will not be wasted.

Salt and sugar have been available in Sápmi during hundreds of years through trade and are important issues for the taste and preservation of traditional food. From a preservation and food safety perspective, the more of both, the better. From a public health perspective, the less the better (Le Bodo, Paquette, Vallieres, & Almeras, 2015; Trieu et al., 2015). In all Nordic countries, consumption of salt is more than three times higher than recommended, and governmental actions for a decreased intake of salt have been taken (Trieu et al., 2015). These actions are nationwide and thus include the Sápmi area.

## 7.11 TRADITIONAL FOOD SECURITY

Food security is an important concept of health that is not to be forgotten. Food security exists “when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an

active and healthy life.” Sápmi is not self-sufficient in food (Nilsson & Evengård, 2015). Thus, in times of large-scale changes in climate and the development of national food systems based on trade rather than local production, traditional food security is an issue of increasing concern. Wild berries, herbs, and wild-caught fish have a potential for increased utilization, at least if problems connected to environmental pollution are solved. Reindeer herding is negatively influenced by climate change (Furberg, Evengard, & Nilsson, 2011). Still, in Norrbotten county in northern Sweden, the number of reindeer amounts to approximately 180,000 pieces (2016), which is more than 10 times as much as the number of cattle in the county. Knowledge of sustainable food systems and traditional food security in Sápmi is likely a keystone to develop future systems for food security and food sovereignty not only among the Sami people, but also in the entire North.

## 7.12 EPILOGUE

So, what did I answer the journalist? I must admit, my reply was neither polite nor collaborative. In retrospect, I wish that I had tried to explain things that are explained in this chapter instead. And I wish that I have ended the dialogue by clarifying that reindeer meat is indeed the food item with highest cultural connotations in Sami culture, but the traditional dietary patterns includes much more than that. A vegan can be a Sami, and a Sami can be a vegan.

And if the journalist did insist on the need of a statement on fear among Sami, I would have explained that climate change is what scares me most, much more than any Nordic nutrition recommendation. I am scared for all challenges connected to future food sovereignty in a rapidly and unpredictably changing Sápmi. If I can help Mother Earth survive by an increased intake of plant food and a decreased intake of red meat, I am more than willing to do this. However, whenever I do eat meat, I prefer eating reindeer or game meat with a sustainable and ecological life before slaughter than eating an industrially produced beef from a meat factory. And maybe, if more people feel and act the same way, this could become a movement to support the reindeer-herding Sami culture and in extension the food sovereignty of Sápmi.

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