CHAPTER 7

Food, nutrition and health in Germany

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Nutritional and Health Aspects of Food in Western Europe
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Introduction

Mental imagery of foods and traditions are abundant when people think of Germany: sausages, sauerkraut, beer and Black Forest Cherry Cake are just the first that may spring to mind. High mountains, dark forests and sky-blue lakes are vistas perhaps associated with dairy cattle, dirndls and lederhosen. Life and lifestyles in the midst of Europe—but just how modern and how traditional are they? This chapter will discuss German food and drink both past and present, and the status of its citizens as a result of ingesting those foods and beverages.

Historical overview

Looking back some two thousand years

The area in central Europe that today is a united Germany looks back on about two millennia of German-speaking inhabitants (mainly Germanic tribes) that were hardly ever united. Instead, the region was divided into larger and smaller states of all kinds. In the 8th century Charlemagne (Charles the Great) established an empire covering southwest Germany, central France and northern Italy and more, with a forcible Christianization of the resident peoples. Pope Leo III acclaimed him emperor of the Holy Roman Empire in Rome but the fragmentation began already upon his death. In the early centuries of the second millennium, France, England and Spain develop centralized monarchies but Germany is composed of many independent and competitive territories. Alliances and exchanges extend into eastern, western and southern regions and over the middle of the second millennium the northern territories form the Hanseatic League, an increasingly powerful trading network. Freeing itself of papal decision rights, the empire title becomes the Holy Roman Empire of the German Nation. The decline of power over the later centuries is linked to the upheaval surrounding the Protestant Reformation. This period is particularly characterized by alternating periods of war and peace. The plundering, ravages and horror of the so called Thirty Year War remain a strong part of German and European peace narrative giving immense importance to the Peace Treaty of Westphalia in 1648 and Prussia as one of the largest states to come out of this. The empire was abolished as late as 1806 by the French while Napoleon's armies imposed French rule. However, by 1815 a Confederation of German states was created after the Congress of Vienna.

High relevance to the development of food culture in today's Germany can be argued for the Roman influence, which brought fruit tree cultivation and grapevines. The difference between Southern and Western regions of Germany on one side and Northern and Eastern regions on the other side can be overlain along the Roman Frontier, known colloquially as the Limes, and more formally as the Upper Germanic-Raetian Limes. In essence the Limes was a kind of fortified Great Wall spanning 550 km between the

Danube and the Rhine. Until the time of the greatest extent of the Roman Empire (around 2nd century CE), it was a barrier to their barbarian neighbors, the native Germanic tribes. The few hundred years of Roman occupation strongly influenced the local cuisine; for example, it was the Romans who brought wine and viticulture to Germany.

Germany's more recent history

Two hundred years after the Peace of Westphalia the Frankfurt Parliament became the first freely elected parliament in Germany. The mid-18th century heralds the start of rapid industrialization in Germany. This included establishment of sugar refineries and trade in Hamburg (Heinzelmann, 2016:158–160) as sugar was needed to accompany the colonial coffee (see below) and sweetmeats served with the bitter beverage. At this time coffee replaced the usual breakfast soup and groats (Heinzelmann, 2016:155). The Prussian monarchy gains strength: Frederick the Great, having been bequeathed a healthy economy and well-trained citizen army by his father, emerges in the 18th century as an ambitious leader. However, it would be a Prussian aristocrat, Bismarck, who achieved German unification in 1871. Though not nearly as extensive as other European colonial powers, Germany begins colonial expansion under the emperor Wilhelm II. Though former colonies are accorded only a low economic value and the most important exports were non-foods (Patch, 1937), they did contribute to the development of food trade in Germany (as elsewhere): many of the supermarkets today once were a Kolonialwarenladen (colonial store) (Werdin, 2004). Coffee, cocoa, tea and spices as well as sugar, bananas and rice were typical foods shipped in and made accessible to a wider public. Germany's plans to expand were brought to a halt by its defeat in the First World War (1914–1918). The Weimar Republic, the period between the First and the Second World War (1939–1945), is characterized by large-scale unemployment and runaway inflation—characteristics shared internationally as the Great Depression in the late 1920s. In January 1923 1 kg bread costs 163 Mark, in November 233 million Mark (Braun, 2007). Citizens took to trading services for food, for example, a theater in Berlin offered its cheapest seats for two eggs and it's most expensive for a pound of butter (Kunzel, 2010). This time brought the rise of Hitler as ruling chancellor in Germany and paved the way for the rise of his political party, the National Socialist German Workers' Party, known as the Nazis. Absolute power was entrenched by the creation of a totalitarian regime under which crimes against humanity were committed (Holocaust genocide). After losing the war, Germany was occupied by the Allied Forces: French (south-west), British (north-west), American (south-east) and Soviet (north-east but excluding Berlin). The entry of foods common to the food culture of the respective occupying forces can still be reconstructed from living memory today. Besides the war and its socio-political and economic aftermath, such as providing civilians with the lowest food rations (1700 cal/person and day, down to 1550 in the British occupied zone)

compared to other groups e.g., displaced persons (2300 cal/person and day), Germany was subjected to a famine and harsh winter 1946–7, exacerbating food insecurity (Rheinish 2013:151–187). In 1946 US food relief was sent through voluntary agencies such as CARE (Cooperative for American Remittances to Europe). They contained meat and fruit preserves, fat, milk, coffee, sugar, honey and egg powder. Being mostly American foodstuffs, hitherto unknown foods such as corned beef were introduced to Germany (Burak, 2011:403).

With the creation of the communist German Democratic Republic (GDR) in 1949 under Soviet occupation, Germany was split into two states commonly known as East Germany and West Germany. While East Germany became very restrictive and economically weak, West Germany thrived and became one of the world's richest nations. The cuisine of the former was influenced by neighboring Polish, Russian and other Soviet bloc cuisines. Communal feeding programmes in worker's canteens and especially in all-day schools were exceedingly important. In contrast, West Germany refused to adopt school meal programmes until very recently. Today some traditional GDR foods have survived, such as Rotkäppchen sparkling wine, Spreewalder gherkins and Bautz'ner mustard.

The post-war era from 1945 to 1991 is also known for the "cold" conflict (Cold War) between the Soviet Union and the Warsaw Pact States with Soviet Communism, and the USA with its allies (NATO) and Western Capitalism (and Imperialism) as their respective and distinctive systems of choice. This division ran through Germany and even the city of Berlin; it ended with the fall of the Berlin Wall on 9th November 1989 paving the way to the reunification of East and West Germany, some two generations after the split.

The more recent period in Germany's history can also be characterized by migratory streams with their concomitant mixing and mash-ups of cultures. In the 19th century many Germans emigrated to America; around the two world wars persons were forcibly displaced or took flight from persecution, becoming refugees both to and from Germany, whereas most immigrants to Germany arrived from the mid-1950s onwards. So-called guest workers were recruited by then West Germany from Italy, Greece, Turkey and former Yugoslavia, while East Germany received contract workers from Vietnam and Mozambique. Today streams come from asylum seekers and free movement of EU citizens. All in all just over 20% of Germany's residents have a migration background. Influences on food culture in Germany are stronger from the former groups than from the latter. One manifestation is in the steady growth of Italian, Greek, Turkish, former Yugoslavian and Vietnamese restaurants throughout Germany. Mushaben (2008:203) studied ethnic enclaves in Berlin, mentioning a rise in Italian restaurants from about 20 during the sixties (Thoms (2011) puts them at under ten) to more than one thousand today. A second manifestation is the specialist greengrocers catering to the Mediterranean food culture (BAMF, 2005:26), typically stocking aubergines, zucchini, sheep's milk cheese, olives and flat breads, as well as bazaars (Vietnamese: Hüwelmeier, 2013). A third

manifestation is the adoption of foods into everyday German living, such as pizza and cappuccino, gyros and döner kebab in pita bread, or Balkan red pepper and grilled meats (Möhring, 2011; BAMF, 2005:33).

Germany today

The Federal Republic of Germany, with over 80 million inhabitants is the largest population of the European Union. It comprises 16 federal states of which 3 are city states (Berlin—the capital, Hamburg, Bremen) and 13 are states with larger territories. The states now have considerable political and legal jurisdiction though federal law takes precedence. Population density overall is at more than 235,000 people per sq. km. Three quarters of the population live in urban areas though few cities breach a million inhabitants (Berlin, Hamburg, Munich and Cologne) but 75 have populations greater than 100,000.

Germany sees itself today as a modern, liberal and democratic country at the heart of Europe. Political participation is broad in a federally organized, strong welfare state. It is the world's fourth-largest economy, soundly orientated to export (every second Euro is earned here) in which agricultural commodities and processed foods play a significant role (BMEL, 2015; GTAI, 2018). Top exported food products are ranked for 2017 as chocolate and other cocoa food, pork, cheese and curd, and bread and baked goods (WTO, n.d.).

Food expenditure (including beverages and tobacco) has dropped from 44% in 1950 (West Germany) to about 14% since 2000 (Destatis, 2019; Statista, 2019b).

Society in Germany is host to a pluralistic, cultural diversity. Four officially recognized national minorities live in Germany: the Danish, Frisian and Sorbian groups and the German Sinti and Roma; all are German nationals. Of these only the Frisians have retained special food traditions: East Frisians maintain a special tea tradition (see also 5.8 Beverages) while North Frisians enjoy a kale feast after the Biikebrennen, annual bonfires lit on February 21st to drive away winter (GNTB, n.d.). The Sorbs are a Slavic minority living in the East of Germany with strong Easter traditions, but these are more handcraft-oriented.

Describing further ethnic diversity is a bit more difficult, as measurement of ethnic affiliation, common in countries such as USA or UK, is not made in Germany. The country does, however, gather data on migration background of its recent immigrants (Salentin, 2014). Of the one in ten German voters with a migrant background, about half originate from former Soviet countries (Poland, Russia, Kazakhstan, Romania) and Turkey. After Europe as a continental region of origin, Asia, Africa and then North America follow. Möhring (2014) shows that guest workers hired to work in the West-German post-war food service industry and later started their own culinary businesses, contributed strongly to the acceptance of ethnic foods into the German diet.

Geography and the natural agricultural landscape

Located in central Europe, Germany covers an area of more than 350,000 sq. km; a little smaller than Sweden and Spain and a little larger than Finland and Norway. Three main geographic regions can be distinguished: the North German Plain, the Central German Uplands and the South German Uplands.

The North German Plain

Its northern border is a coastline comprising 1600 km along the North Sea and 2100 km along the Baltic Sea, separated by the Jutland Peninsula (Denmark). There are a number of islands on both coasts but the coastal features differ: sand, dunes, marsh and mudflats on the North Sea side contrast with shallow bays, inlets and some steep banks to the east. These lowlands are part of the greater North European Plain and contain a number of shallow lakes, especially in the northeast. With a maritime climate, a moderate precipitation and dominant soil type of infertile acid sands, agriculture in this region has been characterized by crops that do well in poor ground such as rye, cabbages and potatoes as well as oats and fodder beets. These are part of traditional dishes such as Grünkohl und Pinkel (kale and pinkel sausage) or Grünkohl und Kassler (kale and smoked pork chops).

South towards the Central Uplands there is an area of more fertile loess soil, which supports wheat, sugar beet and cattle. Dairy cows but also fattening cows are farmed in the northwest, as are pigs and laying and fattening hens. Maize, some field vegetables and in specialized areas fruit is grown (e.g., apples and cherries in the Altes Land south of Hamburg). Barkmann et al. (2017) describe land use and socioeconomic variations moving from east to west, including increasing livestock pasture farming, decreasing proportion of arable land and forest with farm size, increasing economic power and population density and decreasing average age of population.

Though the coastline is relatively small fishing is a traditional seasonal industry and seafood dishes figure prominently in north-west German cooking e.g., Krabbensalat (North Sea shrimp salad) or Labskaus (a mash-up of beef, onion, potatoes, beetroot topped by a fried egg and a pickled herring). Coastal fishery at the North Sea primarily harvests shrimp, plaice and sole. Pollock, herring, mackerel and cod are important to near offshore fishing. On the Baltic coast cod, herring and sprat make up almost 90% of the harvest. Both ecosystems have had their fish communities eroded over the past decades—on the North Sea the decline especially for cod spans about a century while in the Baltic Sea a major change impacting cod and herring largely due to excessive fishing was noted in the late 1980s (Centenera, 2014).

The Central German Uplands

The Central Uplands divide the North German Plain from the southern German foothills and mountains. With few elevations above 1000 m asl, they span the states of (southern)

North Rhine-Westphalia, Lower Saxony, Saxony-Anhalt as well as Rhineland-Palatinate, Saarland, Hesse, Thuringia and Saxony. The terrain is more varied here (and in the south) with deep river valleys, low mountain ranges (e.g., Taunus, Harz, Erzgebirge) and mainly coniferous forest (Thuringia). Ancient beech forests once dominated Germany but large-scale forest clearance since the end of the first millennium made way for agricultural land use. The Rhenish Slate Mountains (Rhine Massif) on the west encompasses the river valleys of the Moselle and the Rhine with many vineyards to the south. The low areas are well suited to grain, fruit and potatoes. Once a major mining and now a post-industrial region, the Ruhr Basin has the highest population density (Rhine-Ruhr metropolitan region) in an otherwise relatively evenly populated country. Traditional foods for the Ruhr region today clearly show the industrial worker history and the first wave of immigrant worker origin (meat with thick sauces and potatoes, stews and thick soups). These were some half a million polish-speaking Prussians by 1910, followed by a second wave a century later, this time of Turks (Lucassen, 2006). Grilled sausages, Frikadellen (meat patties also known as Buletten), döner kebab, half a roasted chicken and French fries are typical street foods in this area.

The South German Uplands

The south German scarplands, also known as the Swabian-Franconian Jura, pass over into Alpine foothills (Allgäu) in Baden-Württemberg and Bavaria, bordering Switzerland, Austria and the Czech Republic from west to east. The Bavarian Alps are home to the highest elevation in Germany, as well as glacial lakes and alpine meadows while the foothills contain lakes with steep, wooded banks. Germany's largest lake, Lake Constance (Bodensee) is located on its southern border. Conifer forests are found on the Alpine slopes and in the Black Forest of the southwest but a mixture of deciduous and coniferous forests make up the Bavarian and Bohemian Forests in the eastern regions, and the Black Forest in the southwest. The source of one of the longest rivers in Europe, the Danube, is located here. The lowland terraces in the river valleys (Rhine, Main and Neckar) have a warm, dry climate and fertile loess-loam soils suited to productive orchards and vineyards. Wheat, barley and dairy cows are also commonly farmed in this area. The Hallertau region in Bavaria is home to the country's and the world's largest hop-growing area. Traditional foods in this region include Laugenbrezeln (a knot-shaped white bread roll dipped in lye), Weißwurst (a white sausage, peeled and eaten with sweet wholegrain mustard), Leberkäse—containing neither liver nor cheese, which would be the literal translation—(a pale pink-colored meatloaf served in thick slices on bread(roll) or with potato salad and beer), and Lebkuchen (a kind of chewy, spicy ginger honeycake cookie often found in heart shapes with icing at folk fairs). Food in the south-east of Germany is also characterized by Austrian influence with many flour-based dishes (Mehlspeisen) such as shredded pancakes (Kaiserschmarrn) and a wide variety of dumplings

(Knödel). On the far west of south Germany, in the Baden region, the proximity to France is a strong influence on the culinary practices. Riesling wine plays an important role and traditional foods include Flammkuchen (crispy pizza-type dish of very thin pastry topped with crème fraîche, chopped onions and bacon), Zwiebelkuchen (onion cake), Käsespätzle (egg noodle casserole with onions and cheese), Schwarzwälder Schinken (Black Forest ham) and Schwarzwälder Kirschtorte (Black Forest cherry cake).

Food-related land and water use in Germany

Overall, Germany uses almost a third of its land for forests and almost half for agriculture, of which 10–15% is permanent pasture. Agriculture is specialized. Neither the forests nor the rivers, lakes or marine coast play a major role in commercial German food production, though aquaculture and inland fisheries do contribute. In its ten-point plan of action, the Federal Ministry for Economic Cooperation and Development (2016) recognizes the value of artisanal fishing and aquaculture farming. About a fifth of the fish produced commercially originates in traditional river and lake fisheries, including species such as eel, perch, pikeperch, pike and whitefish. Aquaculture contributes freshwater and diadromous fish as well as crustaceans (e.g., shrimp) and molluscs (e.g., mussels, oysters). In particular, trout farming in Germany's south and mountain foothills is profitable, followed by carp fishing in freshwater ponds (Centenera, 2014). Innovations are being pursued in aquaponic farming systems, a combination of plant and animal production. First harvests of tomatoes and catfish have been marketed from central Berlin production sites (Kriener, 2014).

Culture and traditions

Holidays, traditional celebrations and their food

Meals on ceremonial occasions such as for rites (weddings, birthdays, funerals, etc.) or holidays usually include meat, fish or fowl. For example, a typical Christmas dinner consists of roast goose, duck or turkey served with red cabbage and potato dumplings. Food and drink is at the centre of many celebrations and fairs, such as the famous Oktoberfest, many local Kirmes (funfairs) and the carnival week leading to Lent as celebrated in the regions around Rhineland (Karneval), Bavaria (Fasching) and Baden-Württemberg (Fasnacht).

Nonetheless many strong traditions centring on food persist. Besides the Easter and Christmas periods, New Year's Eve (Silvester) is celebrated with various foods and fireworks. Sparkling wine or some bubbly drink is used to "Prost" in the New Year at midnight while pink marzipan or chocolate pigs are considered lucky charms. Poultry is avoided because the luck would fly away. Most of the traditional Silvester meals are humble, such as lentil soup (central and east regions), sauerkraut (Rhine area), potato

salad and sausages, herring salad, Käsespätzle (cheese noodles) or Buletten (meatballs). Karpfen Blau (blue carp) is traditionally eaten at New Year or at Christmas served with potatoes, especially on the north-west coast. The carp turns blue because of a vinegar marinade. This tradition is deeply rooted in Christian symbology around fish and water, in fish as an appropriate fasting break and in desired riches (carp produce hundreds of thousands of eggs per spawn). The Berliner (also Krapfen or Kreppel) is a traditional sweet food, a jam-filled donut eaten at New Year throughout Germany. Today's younger generations are choosing Raclette or fondue as Silvester meals, which emphasize a communal aspect and more informal shared food preparation at the dining table.

The Christmas season's traditions begin four Sundays before Christmas Eve (24th December) with Advent (from Latin *adventus*, arrival). Though this time used to be one of fasting, today giving or receiving Advent calendars with 24 windows covering a small chocolate each are now common practice. December 6th, Nikolaustag used to be the day on which the Catholic Saint Nicholas brought presents to children but also a frightening companion. The tradition was later secularized. In the post-war era children would find small gifts (nuts, tangerines, cookies) in their shoes, whereas today people may exchange a small chocolate in the shape of Nikolaus. Traditional Christmas foods include roast goose with apples and raisins, optionally stuffed, served with cabbage or chestnuts. This may have been co-opted from St. Martin's Day on November 11th, which was traditionally celebrated with a roast goose (Martinsgans) and used to herald in a 40-day fasting period until Christmas. Earlier traditional Christmas Day meals were roast pork and today many of the New Year's foods are eaten on Christmas Eve, especially potato salad and sausages.

The Easter festivities take place on five main days: Gründonnerstag (Green Thursday), Karfreitag (Good Friday), Karsamstag (Holy Saturday), Ostersonntag and Ostermontag (Easter Sunday and Monday). Though the "Grün-" in Thursday comes from an old word meaning to cry or whimper, the color associations have been assimilated into traditional herb-based dishes served on this day, such as a Kräutersuppe (herb soup). Fish is a traditional food served on Good Friday and lamb on Easter Sunday. Eggs in all forms—chocolate and candy included—play an important role.

In the period preceding Easter, Carnival and Lent are further living traditions. Lent is the 40-day period of fasting leading up to Easter and traditionally starts on Ash Wednesday, the last day of the Carnival cycle. The tradition of fasting is still observed by some and many more practice abstinence of single foods such as sweets and chocolates, meat, coffee or alcohol (forsa, 2018b). Catholic fasting is understood as one simple meal in the evening and abstaining from meat on Fridays. Finding ways around the rules included understanding everything living in water as fish, so that, fish being permitted, otter and beaver were also once eaten. Beer and other liquids were also permitted, even—interestingly enough—chocolate. Cistercian monastery lore explains the birth of Maultaschen (Swabian ravioli filled with meat and/or spinach) as a hiding place for meat once cooked up by a monk (later also bread and pastry).

In Germany carnival (known as Karneval in the north-west and Fasching in the south) is also called the fifth or foolish season (närrische Zeit). It is a week of regionally diverse festivities beginning on the Fat Thursday before Ash Wednesday. It used to be a time of rich eating prior to fasting but today drinking festivities and sweets thrown from the floats at parades (or eating Krapfen, Bavarian doughnuts, also Berliner) have replaced the older traditions. Rose Monday (Rosenmontag) in Cologne is home to the largest and longest of these parades.

Owing to migration a second monotheistic religion is gaining cultural significance in Germany: Islam. This is the third largest religious community in the country estimated at about 5% of the population. Two-thirds of German Muslims come from Turkey while the remaining third come from a global spread of nations. Muslim food law and traditions play an increasing role in the development of public meal spaces such as at schools and kindergartens. As a consequence pork meat in school canteen menus became a contested hot topic, with politicians and NGOs criticizing schools taking pork off the menu or leaving it on. And finally, once a large and vibrant community, the Jewish community was destroyed by the Holocaust, but a very small community has been revived and are represented by the Central Council of Jews in Germany today.

Culinary arts and habits

Households are small and still characterized by nuclear families, which largely follow traditional sit-down meals at tables in dining areas. Food is prepared in small kitchens designed for efficiency, hygiene and good workflow; its prototype known as the Frankfurt Kitchen was designed by the architect Margarethe Schütte-Lihotzky in 1926 (Hochhaeusl, 2013). More formal customs such as a tablecloth, textile napkins, flowers and candles or other decorations and full cutlery settings are followed less and less, meanwhile informal lifestyles and patchwork households gain ascendancy. Set mealtimes too, are being eroded, but daytimes are still structured by breakfasts (usually rolls or cereals), lunches (often the warm meal of the day) and supper—also known as Abendbrot (literally Evening Bread), indicating the main component, often taken with cold meats, cheese and salads or pickles. A second breakfast and an afternoon in-between meal may be eaten in addition.

Traditional foods from gardens, fields and vineyards

Today food in Germany is mainly acquired from supermarkets and discounters, though specialty butcher and bakery shops and markets are also given some patronage (forsa, 2018a). Bakeries benefit from the more on-the-go eating and snacking style, while traditional butcher shops are closing in droves—between 2005 and 2015 more than 4000 butcher shops closed their doors for good. Markets, farm shops and organic retail outlets are used by few intensively or by some for supplementary buys. Groceries needed

daily are bought in stores that can be reached on foot or within 15 min driving time. Market research shows a nascent use of internet platforms for buying food "for the pantry," not only delivery of ready-to-eat meals. Almost all respondents (97%) in a representative survey indicated that they choose foods on the basis of taste (liking the foods) and also whether the foods are local (78%), followed by product information (57%) and economy (57%). Labels were further important criteria, the most important for half the respondents was the national organic label, followed by a Fair Trade label but not even 40% looked out for animal welfare labels (forsa, 2017). Most towns today have an organic specialty shop and all major retailers stock a growing organic range. Often, town squares are still used for farmer's fresh produce markets and special festivities. These inner city areas were rezoned into pedestrian shopping precincts about 50 years ago, and now are home to many eateries including cafés, restaurants and bars, reflecting changing social habits surrounding dining out.

In Streuobstwiesen fruit (-obst-) trees are scattered (Streu-) in a meadow (-wiesen). This is a traditional and environmentally valuable form of fruit growing, whereby the orchards may be mixed fruits (e.g., cherries, plums, apples, pears) or usually apples (mixed varieties). It has multifunctional properties, producing old varieties of fruit, providing pasture to ungulates (mostly sheep) and meadow grasses for hay as well as living room for highly biodiverse biota (Güll, 2015; Rösler, 2015). Their commercial relevance is gradually returning after a post-war deterioration. Today environmental NGOs and others organize citizen fruit picking and juice making with a mobile press.

Gardening to cover or contribute to personal food needs is undergoing changes in Germany, particularly in and near the larger cities. Kleingärten (literally: small gardens) or Schrebergärten, named after the Leipzig naturopath, Dr. Daniel Schreber who promoted natural playing areas for children during the industrialization mid 1850s still exist in colonies on the peripheries of urban areas. Since their socially-motivated inception they were important for household fruit and vegetable production but this was successively replaced by flowering trees and shrubs as food supply became plentiful and easily accessible. Gardening for fresh food is currently undergoing a renaissance along with more cognizant consumerism and a desire for community connection. The allotments are part of this but urban gardening is tapping into unused urban areas that are not part of the formally organized allotment associations. Additionally, the organizational form is becoming more communal: people prefer to garden together or for a group, e.g., intercultural gardens, not as individual persons or for individual households. The social aspect is more important than the fruits and vegetables produced and prepared for storage. (BSU, 2008:71–97; MUNLV, 2009).

There are thirteen official wine regions, almost all in the south, many with several hundred years of history. These are places of wine-(maker)-festivals (Weinfeste, Winzerfeste) and more than 100 varieties of grapes such as Riesling, Müller-Thurgau, Trollinger and the Pinot varieties noir, gris and blanc (Spät-/Grau-/Weissburgunder). Franconian

wine is mainly from Silvaner grapes and bottled in a unique, squat, round wine bottle known as Bocksbeutel. Vineyards are often on steep slopes next to a river, such as the Mosel, Rhine, Main or Saar. There are rustic, seasonal wine taverns known as Straussen (bunch) in Baden, Besens (brooms) in Württemberg or Hecken (hedge) in Franconia, designated as operating by the bunch of flowers, broom of twigs or freshly cut tree branch at the entry door. Here mostly white but also some red wines are enjoyed where they are grown with traditional local foods including Vesperplatte (like a ploughman's platter) and Schlachtplatte (literally a slaughter-dish comprising blood sausage, liver sausage and various meats). With the decline of small family farms, the Erntedankfest (harvest festival) has largely disappeared off the annual calendar, but drinking Federweißer, the season's sparkling new white almost-wine in autumn, usually with a serving of Zwiebelkuchen (onion tart), is a beloved custom.

Typical foods and food products

The German Nutrition Society (DGE) describes ten guidelines for a wholesome diet (DGE, 2013), the first of which is to enjoy a diversity of foods. Markets and gardens within its borders certainly offer a wide choice and adequate quantities easily accessible to most citizens. Interest in health-promoting, sustainable diets is steadily growing, though significant diet change lags somewhat behind (Gose et al., 2016). Consumers place a high value on environmental qualities and demand more local, organic and fairly traded food products. Germany has the largest market for and is one of the key producers of organic food in the EU (BMEL, 2017).

Fruit

The natural seasons for various fresh fruits harvested in Germany are not very long, perhaps 2–3 months between May and October apiece. Nevertheless, various native and imported fruit play an important role in the diet. Strawberries and rhubarb are welcome signs of spring, followed by a bumper summer array of cherries, berries (blackberries, blueberries, lingonberries, black currants, red currants, gooseberries, raspberries) and plums as well as apricots, peaches and nectarines. Autumn brings grapes, apples, pears and to a lesser degree quinces and elderberries. The most popular imported fruit is the banana, averaging at more than eleven kg per capita consumption (Statista, 2019a) but kiwis, pineapples, mangos and a range of citrus are typical autumn-winter fruits.

Although preferring fresh fruits (sometimes as sliced and ready-to-eat), households enjoy dried (e.g., in mueslis or as snacks), frozen and canned fruits too. Indeed, fruit is also consumed in the form of fruit juices and nectars, more so than in any other EU country (Lieberz, 2016). They are, furthermore, used to distil fruit brandies (also known as Obstler) such as Kirschwasser (cherry liquor) and Himbeergeist (raspberry liquor), or craft a kind of apple cider unique to Frankfurt-am-Main, known as Ebbelwoi

(apple wine) in the local dialect. Rumtopf (rum pot), once a popular way to preserve summer fruits in rum and sugar until serving it as a dessert in winter, has fallen out of fashion but Rote Grütze is still popular: This dessert is made of any mix of red summer berries and cherries cooked with sugar and starch to a thickened mix served cold with vanilla pudding, ice cream or on cream-cheesecakes. Fruits and especially summer fruits are also customary ingredients in cakes, pies and strudels (e.g., Kirschtorte, Zwetschgenkuchen, Apfelstrudel), though the afternoon coffee-and-cake tradition at a specially set table has also fallen out of fashion. Typically, fruits are eaten as bread spreads in the form of jams and jellies, mostly at breakfast time. Though consistently given high priority in a wholesome diet (Boeing et al., 2012), fruit consumption in Germany has been steadily on the decline and has largely not met the recommended two portions a day (about 250 g) as shown in national consumption surveys (DGE, 2011).

Vegetables, legumes and mushrooms

Potatoes (11.6 million t), cabbage (800,000 t), carrots (500,000 t) and onions (400,000 t) are the most important basic vegetables grown in Germany. Imported fresh vegetables in contrast are crowned by tomatoes (700,000 t) and paprika (300,000 t). Tomatoes are also the most popular in terms of consumption (about 10 kg per capita), followed by carrots (7.8 kg per capita) and cucumbers (6.2 kg per capita). Experts note that these selections are more easily eaten raw and hence reminiscent of fruit (DFHV, 2012) and also less likely to taste bitter.

The leek family, green beans and mushrooms are further found in traditional dishes. When the strawberry season starts in Germany, consumers know that asparagus season starts too: this highly popular vegetable has the most agricultural acreage devoted to it (27,000 ha or a fifth of vegetable-growing land in Germany) producing 120,000 t in 2016. White asparagus is favored vastly over green, earning it the appellation "white gold," and is typically bought at roadside stands during the season, which ends punctually on Midsummer (Johannistag). Indeed, Germany has an asparagus route (Spargelstrasse) 750 km long and crossing four federal states. Traditionally it is eaten with a Sauce Hollandaise, perhaps with ham and/or potatoes though lighter and more modern combinations are gaining restaurant menu space.

Dietary recommendations suggest at least three portions of vegetables per day for micronutrients, dietary fiber and phytochemicals, together with fruit making up the five-a-day rule. But similarly to fruit, most citizens don't reach the 400 g per day recommended for adults (Heuer et al., 2015). Legumes may be included—lentils, chick peas and dried beans—but these are still often associated with older generation stews or soups or coffee substitutes (Garbanzo Beans, Lupin) and only slowly gaining independent culinary attraction, their uptake into the Slow Food Ark of Taste notwithstanding. Recent political and scientific focus on plant-sources for dietary protein may help.

Nuts and seeds

Given the relatively small amount of nuts and seeds consumed in relation to other food groups, it is not surprising that they are hardly mentioned in the ten guidelines of the German Nutrition Society for a wholesome diet, nor does Germany produce significant amounts of nuts (Lieberz, 2015). However, import and consumption have been steadily rising and especially nuts are found in a number of typical diet niches. These include being eaten raw (shelled) or roasted (e.g., roasted chestnuts and candied almonds at winter folk festivals), salted as snacks, in mueslis, cakes and cookies (especially at Christmastime), breads (e.g., walnut bread), as salad toppings and in the form of plant oils—typically rapeseed and sunflower seed—and specialty oils such as poppy seed or flaxseed. A further niche specialty is nut butters, but also some nut milks. However, the most important two nuts for the German food market are for ingredients in other foods and these are almonds (marzipan, chocolate, cereals, bakery items) and hazelnuts (nougat as well as confectionary, pastry and bakery products). The latter are an important ingredient in the very popular hazelnut and cocoa spread Nutella (OECD, 2012:17), found as a typical breakfast food on German tables. The former—in the form of marzipan—is an important sweet for the Christmas season, and can be found, e.g., in Christmas stollen, a traditional fruit-and-nut cake. Persipan—made with apricot and peach kernels instead of almonds—is increasingly used in confectionary. The history of stollen-baking in the city of Dresden goes back to the 15th century; the authentic Dresden Stollen carries the Protected Geographical Indication (PGI) label of the EU. The Hanseatic City of Lübeck is home to many marzipan manufacturers (e.g., Niederegger) and has also protected its 100-year old production tradition with a PGI label.

Grains

Wheat (including spelt), rye, barley, oats, triticale and maize are the most significant cereals grown in Germany (BMEL, 2016). Besides use for beer brewing (barley) and fodder (triticale, maize and certain qualities of other cereals), grains are processed largely in the milling and baking industries. Flour is used to make breads and rolls, pretzels, cakes, biscuits and noodles as well as dumplings, pastries and frozen bakery products. Germany does have an own noodle tradition, albeit lesser known: Swabian Spätzle and Knöpfle, Schupfnudeln, Maultaschen and other noodle production mostly in Baden-Württemberg. The southern regions are also home to other more flour-based dishes and meals including dumplings (Serviettenknödel) and sweet dishes (Mehlspeisen). Nevertheless, Germany is better known as a bread nation: It is ranked as the fifth largest bakery market worldwide and the largest in the EU (Bernard, 2016). The German Bread Institute claims that there are over 3000 bread specialities being sold in Germany; almost two-thirds comprise a mix of wheat and rye flour, toast breads rank next, followed by seed loaves and wholegrain breads. It is considered a valuable dietary component especially

due to dietary fiber, and wholegrain products are recommended over highly refined flour-based products. Bread culture and artisan craft in Germany is now considered UNESCO intangible cultural heritage, with old traditions such as presenting new neighbors with bread and salt to wish them always plenty of food and funds, still being practiced in more rural areas.

Paul Richards refers to Westphalian ham and pumpernickel bread as a well-known delicacy in his 1918 edition of the book Baker's Bread. Baked with coarser, dark-grade rye flour, rye groats, water, salt and some sourdough, this black bread may be varied by the addition of molasses for a slightly sweeter taste, or by aromatic seeds such as caraway, anise, coriander or fennel. Traditionally, this is a slow baked bread, taking at least 16 h in closed tins, according to the German Lebensmittelbuch (official collection of food standards and product descriptions), that results in the typical bittersweet caramel-type aroma and the long shelf life. Besides its use for savory bread meals, it is found as ingredient in soups and desserts, such as Westfälische Stippmilch and Holsteiner Verschleiertes Bauernmädchen. Both dishes are variations of a layered dessert made primarily with fruit (Morello cherries in the former, apples in the latter), quark cream and pumpernickel (roasted with sugar in the latter). Westphalian pumpernickel has been recognized as a regional speciality (PGI) by the EU.

Dairy products and eggs

Milk and dairy products are considered important elements of a healthy diet in more than 40 countries worldwide i.e. due to their proteins, vitamin B group, calcium and trace elements. German recommendations suggest daily consumption of 200–250 g/d milk/yoghurt and 50–60 g/d cheese (Hilbig et al., 2009). Average consumption does not quite reach this goal—it's at 190 g/d—but it is an important source for vitamins B12 and B2, zinc and iodine nonetheless (Watzl, 2017). Epidemiological data suggest that the consumption of milk and dairy products is associated with a lower risk of a range of diseases (Pfeuffer and Watzl, 2018) though nutrition experts consistently favor low-fat versions over full-fat. Milk in Germany is typically from dairy cows, to a lesser extent from dairy sheep and goats. Products processed in some 150 dairies include cheeses (mostly in Bavaria), yoghurts, cream, butter and some fermented foods.

A wide variety of cheeses are found throughout Germany as an integral part of dishes and meals, e.g., Obatzda, a cheese spread prepared by stretching older Camembert or Brie with butter, spicing it with paprika and mixing in onions, salt, pepper and a dash of beer. About three-quarters of all German cheeses are produced in Bavaria, but the federal states on the northern coast are also important cheese-producing regions. Schleswig-Holstein is home to a 500-km long cheese route comprising about 40 artisanal cheese makers on cow, sheep and goat dairy farms. A number of German cheeses have been influenced by neighbors, e.g., Belgians (Limburger), Dutch (Tilsiter) and Swiss (Emmentaler).

Of the 400 or more varieties some, such as Blue vein cheeses (e.g., Bavarian Blu or Edelpilzkäse) gained acceptance only in the nineties. The German Cheese Ordinance (Käseverordnung) clearly sets out six categories of cheese based on the water content of the non-fatty matter. These are the categories with traditional German examples (and assimilated from neighboring countries):

(i) extra hard cheeses (Hartkäse) e.g., Allgäuer Emmenthaler, Bergkäse
(ii) hard, sliced cheese (Schnittkäse) e.g., Edamer, Appenzeller (Gouda)
(iii) semi-hard sliced cheese (halbfester Schnittkäse) e.g., Butterkäse, Holsteiner Tilsiter (Balkan cheese (feta-type))
(iv) sour curd cheese (Sauermilchkäse) e.g., Harzer Roller, Handkäse, Kochkäse, Nieheimer
(v) soft cheese (Weichkäse) e.g., Limburger, Romadur, Munster (Camembert, Brie)
(vi) fresh, non-matured (not ripened) cheese (Frischkäse) e.g., Quark, cream and cottage cheeses (ricotta, mozarella)

Three examples of traditional German cheeses are listed in the Slowfood Ark of Taste and registered in the EU's PDO/PDI. Nieheimer sour curd cheese is produced in the eponymous town in North Rhine-Westphalia. The old cheese tradition is explained in the local cheese museum, which is one of four museums together with one for bread, ham and beer making up the Westphalian Culinarium. Nieheim is on the Cheese Route and hosts a biannual cheese market. Weißlacker soft cheese is an authentic Allgäu cheese produced in Swabia and around Ravensburg and Lake Constance in Baden-Württemberg. Also known as beer cheese (Bierkäse), it is traditionally eaten in beer gardens with sliced rye or pumpernickel bread and may be accompanied by chopped raw onion, melted on Käsespätzle or thinly sliced in sausage salad. Würchwitzer Milbenkäse is an unusual mite-ripened cheese with a 500-year old history in the small town of Würchwitz in eastern Germany. Eaten with the mites, it is typically grated, mixed with butter and spread on bread slices.

Cheese is mostly eaten as a topping for bread or more recently as a melt in heated dishes. Traditional German cheesecake is a shortcrust pastry filled with a quark mix and baked to a yellow-golden-brown color.

Eggs are a further important element of a healthy diet and the German Nutrition Society recommends up to three eggs per person and day, including "hidden eggs." Studies seem to show that consumption meets this but recent data does not include cakes and pastries. Hen's egg protein is of high nutritional quality and eggs can contribute to vitamin and mineral requirements. German consumers are increasingly vocal about animal welfare and try to choose free-range or even organic eggs. Besides being a typical breakfast food, eggs are eaten in pancakes and waffles or hardboiled in salads. A traditional spring dish comprises hardboiled eggs and a creamy Green Sauce made with seven herbs (borage, chervil, cress, parsley, burnet, sorrel, chives). Further accompaniments may be potatoes, asparagus, together with fish or Tafelspitz (boiled beef).

Meat

This food group enjoys high consumption rates among the German population, on average double as high as the recommendations for a healthy diet (300–600 g meat/sausage per capita per week). In recent years, consumption is decreasing very slightly and meat substitutes are making market inroads, perhaps due to repeated calls to lower meat consumption linked to climate change and animal welfare. The many associated health risks of a high-meat diet have so far failed to change patterns. The political dimension of meat and consequences of the system are highlighted by the so-called Meat Atlas, published annually by the Heinrich Boell Foundation, an environmental NGO. Pork is the most commonly eaten meat (more than 38 kg/capita), veal, beef and game (deer, pheasant, wild boar, duck) is also popular, but poultry (chicken, turkey) is steadily gaining ground (11 kg/capita). Favorite meat products, though, are hams and sausages in all their myriad variants. Hams may be cooked or raw, smoked, spiced, dried and stored in different ways. Sausages number almost 1500 varieties across scalded (Brühwurst), cooked (Kochwurst) and raw (Rohwurst) types. Traditional dishes even include cold salads made of sausages (Wurstsalat) typically served with beer. Lyoner, a type of Brühwurst, has a mild flavor and a firm, uniform composition and is usually used for Wurstsalat. The sausage is cut into thin strips, mixed together with diced pickles, onion rings, mayonnaise and mustard or marinated in vinaigrette.

Fish

During the Middle Ages two varieties of fish use became dominant. One came from maritime fishery, especially herring (Pedro and Nunes, 2007), and involved one of the oldest methods of fish preservation, indeed of meat preservation, namely salting. The other came from monastic pisciculture, supported by the preference of fresh over salted fish. Beveridge and Little (2002) confirm the common carp as key to pond farming's development in continental Europe in the last two millennia. Fish advanced to a dietary staple for some time and the tradition of serving fish on Fridays that was adopted during this time, still can be seen on many German canteen menus today. River fishing also contributed to this: traditional river fishing at the Sieg River's entry into the Rhine is one of the recognized German intangible cultural heritages.

Today fish occupies an increasingly difficult position in German diets: lauded by nutrition experts as an excellent food and source of unsaturated fatty acids, vitamins, trace elements and proteins but criticized heavily as a highly endangered and dwindling resource (Greenpeace, 2016; WWF, 2018). The DGE recommends one to two servings of fish per week (150–220 g); on average, citizens meet the recommendations, but not all. Consumers choose mostly frozen (27%) and canned (26%) fish, fresh (12%) and smoked (13%) fish are less popular choices (FIZ, 2017). Fish and seafood specialty shops represent only 5% of sales, supermarkets and discounters account for almost 90%.

Within Germany there is a clear North-South gradient for fish consumption, with higher consumption clearly hugging the Northern coastline (FIZ, 2017). To-go or street food variations mostly offer fish on a roll (Fischbrötchen). One of the traditional dishes still enjoyed today is Red Herring Salad. Bite-sized pieces of Herring or Matjes filets are mixed with cooked red beet, hard-boiled eggs, apples and onions in a yoghurt or sour cream dressing. Herring is still widely favored as a traditional New Year's dish in many regions.

Beverages

For a healthy diet the DGE recommends drinking at least one-and-a-half liters of non-alcoholic beverages every day. Half of this is covered by water consumption in Germany, a quarter by tea and coffee. The remaining quarter mainly comprises fruit juices and soft drinks (Heuer et al., 2015). Spas, mineral and carbonated water occupy a special place in Germany. There are about 450 brands of bottled water and many natural springs, often associated with health, healing and a supply of minerals in the diet. The federal government regulates mineral water sold as a foodstuff by means of the Mineral and Table Water Regulation (MTVO). Some of the reservoirs and aquifers have been used since Romans first settled in Germany.

Coffee and tea are typically served at breakfast, but also enjoyed throughout the day. Today East Frisian tea customs—pouring tea over candied sugar (Kluntjes) and adding cream—are part of the German inventory of intangible cultural heritage.

Alcoholic beverages are widely enjoyed in Germany, which is well-known as a land of beer. Drinking beer in beer gardens, sitting outside under chestnut trees, are images strongly associated with Germany and in particular Bavaria. German beer is brewed according to the Purity Law (Reinheitsgebot) which stipulates that only barley malt, hops, yeast and water may be used to make beer. Traditional varieties include Pilsner, Pale Lager / Export, Wheat Beer (Hefeweizen), Dark Lager and Bock Beer. Brandy and schnapps are also popular, as are wines. Seasonal customs include Federweißer (very young, new wine) enjoyed with Onion Tart (Zwiebelkuchen) in autumn and spiced mulled wine (Glühwein) as a traditional winter's drink, especially at Christmas markets.

Condiments

Though a small food group and nutritionally mostly associated with low-salt recommendations, condiments deserve a short mention. Both cruet (salt, pepper, mustard, vinegar) and bouquet garni pour bouillon (leek, carrot, celeriac) are traditional condiments in cooking, but Germany stands out as part of a central European region with a lack of traditional glutamate source. Perhaps this did not need to develop in a region relatively richly supplied with animal protein (dairy, meat, fish) but even so many comparable countries or regions have a traditional (e.g., soy sauce, fish sauce) or modern

(e.g., marmite, vegemite) counterpart. For a short time in the post-war era, a dark, hydrolysed vegetable protein-based sauce known as Maggi (Nestlé) was found on home tables and can still be found in some canteens today.

Food preservation and shelf-life

Since human habitation in Northern continental Europe there has been a need for techniques to make food last longer, in order to survive weather and harvest vagaries. Today food preservation takes place in the private household—on the decline—and in commercial food production—on the increase. Options are still basically categorized to chemical, physical or biological means used to slow down or stop microbiological activity and therewith spoilage.

Physical preservation techniques

By 2017 effectively all German households had a fridge or fridge-freezer (UBA, 2018), the most common thermal treatment to slow food spoilage. Stand-alone freezers are the only household appliance whose numbers are decreasing: In 1988, 70% of West-German households (43% of East-German households) had a freezer, in 2013 this figure had dropped to 53% for West-German households (41% for East-German) (Geißler, 2014). At the same time commercial supply of frozen foods has risen steadily to an average annual per capita consumption of 46.3 kg excluding ice-cream. Frozen foods cover all food groups, particularly vegetables, fruit, baked items and ready-to-eat meals (especially pizzas). Blanching may take place to inactivate enzymes prior to freezing vegetables. Rapid freezing, known as cook-freeze, and rapid cooling, known as cook-chill, are also routinely employed as preservation techniques in the catering and restaurant industries.

Extending shelf-life by heating has a long tradition in German households, so much so that the term "einwecken" comes from the tempered glass jars used for home pasteurization and sterilization, produced by the company Weck since 1900 (Weck, n.d.). Used extensively in the post-war years by families with allotment gardens (Schrebergärten), fruit and vegetables were typically conserved in late summer and stored in cellars.

Dehydration is very little used in private capacities (for fruit, vegetables, herbs and mushrooms), mostly due to the high-energy need, perceived as energy waste. Treating foods with ionizing radiation is under a general ban in Germany. Irradiation is only permitted for dried herbs and spices as oppose to some other EU member states which permit it for more foodstuffs.

Chemical preservation techniques

Foodstuffs are treated with certain substances in order to delay development of or kill microorganisms. In household such techniques using sugar are still well-known to make

jams and jellies from fruits. Using salt (solutions) to cure meats, preserve fish or extend the shelf life of butter is mostly a commercial process in Germany today. Liquids such as vinegar (for vegetables), oil (for vegetables), alcohol (for fruit) and brine (for animal products, beans) are typically used in specific food groups, mirroring preferred tastes and traditions. Using smoke to preserve meat also has a long tradition in Germany, though this is mainly carried out by professionals today, using both cold and hot smoking techniques. Commercial food production can enlist the aid of 41 additives that function to preserve foods as authorized in the EU. Examples include sorbic acid (E200), which occurs naturally in fruit and is used i.e. in the preservation of cheese, benzoates (E210–213) used e.g., in the preservation of fruit juices, sulphites (E221–228) typically used in wine treatment, and nitrites and nitrates (E249–252) typically used in processed meat products.

Biological preservation techniques

Lactic acid fermentation applied to cabbage to make what has been called Germany's superfood—sauerkraut—is probably the best-known food of the country. It is eaten as a salad or side dish, hot or cold, and more easily digested due to slackening of the plant tissue. Though still carried out in small-scale farms, sauerkraut production is otherwise completely commercial in bulk fermentation tanks (Breidt et al., 2013). Bio-preservation by food producers also sees the use of enzymes, not just lactic acid bacteria. Food and drink analysts claim that lactic acid fermentation is increasingly important to juice innovations, offering improved vitamin and enzyme levels, for example in vegetable juices.

Further preservation techniques

Industrial technologies are rapidly developing in the field of food processing, and in the application to preservation. Modified atmosphere, while not new, is used across all food product categories, especially for fresh products both in warehouses (e.g., fruit) and in packaging fresh or chilled products (e.g., ready cut salads). Linde AG, a German technology company with a 139-year history, is a key player in the Modified Atmosphere Packaging (MAP) global market. Retail food products packaged under modified (or controlled) atmosphere are better accepted in Germany than in the USA. At the same time, the common practice of packaging meat under high (70–80%) oxygen has been criticized by consumer watchdogs because of possible sensory aberrations (Lücke and Schreiber, 2014).

The use of high pressure processing (HPP) in fruit and vegetable juice treatment has recently reached commercial markets and enjoys consumer acceptance in Germany because it maintains color (Gopal et al., 2017) and is regarded as a more natural technique. Needing neither thermal treatment nor additives, this method of preservation meets German consumer preference for "clean" and minimally processed foods. Along with Italy, Spain and the UK, Germany is classified as an early adopter of HPP technology and contains a number of equipment specialists such as ThyssenKrupp AG (MarketandMarkets, 2016).

Further technologies including ultrasound, light, pulsed electrical fields, magnetic fields, edible coatings and encapsulations are not widespread in commercial applications yet (Berghofer et al., 2015).

Present health, nutritional and food safety conditions

Every four years the German Nutrition Report is published by the DGE on behalf of the Federal Republic at the directive of the Federal Ministry of Consumer Protection, Food and Agriculture. In its most recent report on the nutritional situation in Germany (DGE, 2016), it presents a mixed picture of advantages and disadvantages connected with the consumption of various food groups, as described above. On a nutrient level, there is some concern about the unsatisfactory vitamin D supply due to local solar altitude; older persons are considered a risk group for developing a vitamin D deficiency. While folate supply overall is adequate, women of a child-bearing age are deemed at risk and public health campaigns strive to readdress this (Mensink et al., 2016; Krawinkel et al., 2014; BfR, 2017). Sodium consumption is deemed too high, as measured by urinary excretion, and choosing low-salt foods similarly continues to be a repeated message to both consumers and the food industry. A long-standing critical nutrient is iodine; the measure used to counteract low supply is iodised salt—both for household use but especially in industrial food formulation.

The development of overweight and obesity in the population, and specifically in children, is being given much attention, for example by programmes aimed at education settings (pre-primary, primary and secondary schools). Roughly 10% of children are overweight when they start school, of these around 4% are obese. More than 40% of adult men and almost a quarter of adult women are overweight (pre-obese). The prevalence of obesity in Germany is high and cause for grave concern in the light of the high concomitant risks for coronary heart disease and diabetes mellitus (RKI, 2016). Improvements can be mainly attributed to better detection and disease management rather than dietary related interventions, for example in workplace settings, or changes. However, it may take some time before the National Action Plan (IN FORM—German national initiative to promote healthy diets and physical activity) aiming to promote healthy diets and physical activity (BMELV and BMG, 2013) shows success. Health risks from food spoilage are relatively low and well controlled.

Food safety in Germany is accorded high status and has its own federal Department of Food Safety (Bundesinstitut für Risikobewertung (BfR)), which reports to the Federal Ministry of Food and Agriculture (BMEL). Food safety surveillance is complex in structure and the responsibility for inspection and control lies with the federal states, which employ scientifically trained experts including food chemists and veterinary doctors. Hygiene and hazard analysis and critical control points (HACCP) implementation are part of food professionals' training countrywide.

Summary

Given its geographical space in central Europe and its history of human activity spanning some millennia, Germany today presents a rich trove of foods, production and processing techniques and cultural traditions. It has absorbed and transmuted many influences, often out of necessity. In this well-to-do country, its citizens enjoy a high standard of living and have easy access to all food groups in all forms. Population mobility and lifestyle changes will continue to play a role in diet and health developments in the next years.

Open questions

- Food and food culture related skills and techniques are being steadily lost or eroded. In the balance, what is lost and what is gained? Where will household-scale innovation come from? Can food literacy be taught successfully solely at schools? If there were long-term disaster situations in Germany, how well would its citizens cope with managing healthy food and water?
- Processed foods are rapidly making up the greater share of foods eaten and yet highly processed foods are consistently deemed better to avoid in respective sets of recommendations. Are practicable categories of processed foods needed for consumers to guide shopping, such as those of von Koerber et al. (2004), and for public health researchers to explore data, such as the NOVA classification (Monteiro et al., 2016)?

Future outlook

The Federal Statistical Office (2009) projects that in 2060 every third person in Germany will be 65 years or older and there will be twice as many 70-year-olds as newborns. The aging population in Germany necessitates the facilitation of healthy aging from as early as possible—food, nutrition, diet and activity will play even more important roles than they already do today. Bioeconomy oriented efforts may bring side streams and new food sources to our plates (e.g., see Schlüter et al., 2017). Food fraud and food counterfeiting may both increase further. Indeed, food futures in Germany may be largely twofold, according to current trajectories: (1) Further industrial scale development of food products, formulations and technologies, favoring larger and larger scales with continued high safety standards and controls, even more concentration to vertically integrated Big Food Players, and (2) niches or pockets of artisan foods and producers with direct marketing, small independent craft operations with predominantly local communities of support or even seasonal participation in production gatherings on farms, in gardens and semi-professional kitchens, carried by those who favor fresh and simple foods.

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