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1. Introduction

Globally, meat production and consumption have a clear upward trend, mostly due to rising production and consumption in countries such as China. Although, such a trend is not true for most countries in Europe in the recent past, even the more stable overall pattern of meat production and consumption in Europe can be considered much too high, creating serious environmental and human and animal welfare risks. Lowering meat consumption in the global North by about one third, a manageable decrease, would significantly improve the situation on a global scale (Grethe et al. 2011; Aiking et al., 2006).[1] One of the primary questions of interest thereof is, are there ways of reducing the demand for meat, especially in the global North, where it is overconsumed?

This paper includes an overview of how the consumption of meat in a number of European countries has developed over the last half a century, especially in terms of differences and similarities between the countries. Is the development homogenous? This paper also seeks to explore what has influenced meat consumption in the past. Possible influences on the consumption trends, such as standard of living, urbanisation, price of meat (resulting mainly from the intensification of meat production), the global meat trade, and social factors including food scares and fashionable diets, are discussed, although definite causes for specific population wide meat consumption trends are very difficult to find or prove with quantitative data. Influences that would tend to decrease, rather than increase, meat consumption in the past have mostly not been intentional, apart from certain governmental dietary guidelines, and even those are only very recent.[2] Looking into the past, this paper does not therefore intend to answer the question of how to (intentionally) reduce meat consumption. Instead, it gives one view into the past with the idea that there can be insights for future, more sustainable meat consumption patterns. Some qualitative analysis is also suggested, in the end, as a means for further research.

1.1 The problem of meat

The excessive consumption of meat has been in large part facilitated by the industrial meat production methods developed since WWII, one of the biggest changes in the entire food and agriculture industry (van Otterloo, 2012). Increasingly, the meat produced in the global South is also industrial, and so, currently for example, three quarters of the world's chickens and one third of pigs are produced on industrial farms, and in the near future these numbers may rise rapidly (Gura, 2010). Intensive animal agriculture has generated problems arising from both the production and consumption systems. These problems can be divided to four main categories: issues directly linked to human welfare, issues linked to animal welfare, ethical risks, and lastly, the range of environmental risks.

Firstly, *direct risks to human welfare* include those generated from the production methods, affecting either food safety or the risk of new illnesses, or both. The domestication of farm

[1] The impact on food security of a reduction in meat consumption in the global South is, however, questionable. Also Rosegrant et al. (1999) conclude this from their research. Stehfest et al. (2009), on the other hand, conduct a scenario study whereby a global transition to a low-meat-diet would bring considerable world-wide climate, health and land use benefits.

[2] Also, the effects of a future policy on reduced meat consumption would have to be much stronger than what such dietary guidelines could be expected to produce.

animals has most likely brought about most of the common human viral diseases over the last 10,000 years with the viruses jumping from animals to humans in close contact. However, the ever increasing expansion and intensification of meat production - especially in poorer and less regulated conditions in the global South, but also in the global North - has led to the dramatic increase in the emergence and spread of infectious diseases originating in animals, such as the avian flu (Greger, 2010).[3] The contamination of meat intended for consumption by therapeutic or growth-promoting antibiotics, growth hormones, animal faeces containing bacteria, such as E. coli, or toxins, such as dioxin, is a related but serious risk to human welfare.[4]

Direct human welfare risks are also generated from poor working conditions in the industry, most importantly from: high rates of injury, often extremely low pay, lack of benefits, and enormous stress due to the rapid pace of work, foul working environment and the expected ruthless handling of live animals. According to Foer (2009), the annual personnel turnover rates in the United States typically exceed 100%, and are possibly up to around 150%.

Further, the excessive consumption of meat, and especially red meat and processed meats is likely to increase risks of certain illnesses, such as cancer and cardiovascular disease (e.g. Sinha et al., 2009; Westhoek et al., 2011; McMichael and Butler, 2010).[5]

Finally, meat production has an impact on poverty and malnutrition. Tudge (2010), among others, argues that poverty in the global South is being amplified by the gradual industrialisation of meat production there. The human labour input that has helped employ large masses of people on subsistence farms in the South is being cut in the name of efficiency, simultaneously, however, increasing unemployment and decreasing access to food production (Tudge, 2010; Fiddes, 1991). Growing feed for meat producing animals worsens food shortages also through deforestation and the displacement of local populations from their traditional lands.

The problems related to *animal welfare* are linked to the treatment of animals in intensive agricultural production systems. The problems are caused by lack of both physical and mental wellbeing of farmed animals, which also lead to human welfare risks, on the one hand, through the use of large amounts of therapeutic antibiotics to contain disease, and on the other hand, through stressed animals being exposed to diseases that end up infecting humans, as mentioned above.[6]

The lack of wellbeing of the production animals is also an issue for the third category of problems in intensive meat production and consumption, relating to the *ethics of meat production*. On the one hand, it can be said that cruelty towards animals is wrong at an absolute level of morality, and on the other hand, it has side effects, such as the corruption of

[3] The H1N1 influenza virus (swine flu) originated most likely in the United States, so in the global North.
[4] Further, bovine spongiform encephalopathy (BSE) infected meat can be included here. The problem originates from the UK 1980s' epidemics.
[5] Westhoek et al. (2012) calculate that a 50% reduction in all meat and dairy consumption would lead to what is currently considered a healthy level of saturated fat and red meat consumption.
[6] The lack of mental wellbeing of the production animals can also be an issue for the quality of meat (see e.g. Lawrie, 1977, discussing the effect of animal stress).

ethics (see e.g. Williams, 2008). Rawles (2010) argues that animal welfare should be included in the concept of sustainable development, alongside economy, environment and society, since sustainable development in itself is 'ethically aspirational'. Further, she believes that regarding animal welfare as a luxury we cannot afford, because of more dire economic and environmental pressures, reflects the 'instrumental thinking' (regarding nature) that is at the root of the problems we are facing in the first place. However, Westhoek et al. (2011) argue that there is a conflict between addressing the animal welfare issue and environmental concerns, as the former generally leads to higher feed requirements and greenhouse gas emission levels. A reduction on overall consumption of meat would be likely to solve this conflict.

Further on the ethical aspects of industrial meat production, as discussed above, the increasing industrialisation of meat production in the global South can be argued to significantly increase unemployment and poverty there (e.g. Tudge, 2010). This creates an ethical problem whereby the 'progress' of industrialisation transferred from the global North to the South increases the welfare divide between the North and the South.

Last but not least, the *environmental risks* stem from the scale of production and lack of consideration for the effects of inputs (e.g. land, oil, water, uniform agricultural animal species) and surplus outputs (e.g. manure), which cause air, water and ground pollution, in addition to increasing greenhouse gases, land use change, depletion of natural resources, and threats to biodiversity.

Perhaps less discussed than the impacts of other inputs, such as oil for feed fertilizers and energy, the water footprint of industrial meat farming is considerable. Hoekstra (2010) gives one estimate of the water footprint of average diets in the global North. An average meat diet for one single day costs 3600 litres of water, while an average vegetarian diet consumes only 2300 litres. The numbers for the global South are lower, 2050 and 1750 litres, respectively.[7] The pollution of waterways by fertilizers and manure is an additional problem, not accounted for in these figures. In fact, more than 80% of the nitrogen inputs into animal agriculture are lost (Westhoek et al., 2011), impacting on terrestrial biodiversity in addition to increasing water pollution. Bleeker et al. (2012) conclude from their study on the effect of different diets on nitrogen losses to the environment that only a complete change to vegetable protein results in a significant reduction of the nitrogen footprint.

Agriculture's contribution to greenhouse gas (GHG) emissions is estimated to be up to a third of all emissions when fossil fuel inputs are included (Garnett, 2010). Importantly, this figure, however, does not include emissions related to the processing, transport, retail, and consumption of food, or the resulting waste. Industrial meat and dairy production contribute about half of the total food impact on emissions (e.g. EC, 2006), with the largest impact made at the farm stage. The FAO (Steinfeld et al., 2006) has calculated the global impact of

[7] Vanham (2012) has estimated that eating a healthy (according to current dietary recommendations) Austrian diet (rather than an average one) would reduce the water footprint by about 20%, with the reduction mainly coming from reduced amount of consumed meat.

livestock production, including the impact of land use changes, at 18 per cent of all GHG emissions.[8]

FAO (Steinfeld et al, 2006) has also estimated that two thirds of agricultural land, and one third of all land surface, is currently used in livestock production, directly or indirectly. With the associated continuing destruction of rainforests and grasslands, intensive meat production destroys the diversity of species and ecosystems. About 30% of human-induced biodiversity loss is related to livestock production (Westhoek et al., 2011). The third form of biodiversity, within a species, is also threatened by the uniformity of livestock breeds used in intensive farming. Gura (2010) and IAASTD (2007) argue that small-scale farming with local breeds is the key to more sustainable meat production and more employment, not multinationals and industrial farming. However, industrial livestock production, in the hands of a small number of multinationals and using only a small number of animal breeds, is currently growing seven times faster than small-scale farming in the global South, according to the FAO (2007).[9, 10]

Lastly, the efficiency with which the energy contained in the inputs is converted into energy in the outputs, i.e. meat, is exceedingly low in typical intensive animal agriculture. According to Smil (2002), for example, 97% of gross energy in the feed for cows in the USA is *not* converted into beef.[11] The European Union imports four fifths of the protein-rich feed (Westhoek et al., 2011), therefore 'exporting' the problems created by the high demand for energy and other inputs for the feed, as well as the problem of land-use change.

The considerable increases in the production and consumption of meat observed in the recent past, and expected for the future decades - due to the expected increases in the population and living standards in the global South - carry the largest consequences for the environment, as they are likely to greatly worsen the current problems related to intensive meat production and consumption.

As Garnett (2010) notes, the problems described in this section need to be addressed in an integrated way, rather than by dealing with one problem, or a risk, at a time. Transforming the meat production methods accordingly would most likely have to bring meat consumption levels down considerably, especially considering the expected global population growth, and alternative (meat) protein sources would have to be developed on a large scale. However, food consumption is not easily dealt with purely at a rational level, as eating any food involves social rules, habits, meaning and emotions. Similarly, the topic of meat overconsumption is controversial, and therefore, generates much discussion. The concluding

[8] However, the range of estimates is large, with Goodland and Anhang (2009) calculating a contribution as high as 51%, although Herrero et al. (2009) criticize this number for being generated by poor methodology and oversimplification. Further, e.g. Westhoek et al. (2011) contest even the FAO figure as too high, with their own estimate at 12%.

[9] Gene banks are often seen as a solution for keeping the genetic variety of livestock and therefore providing resistance to diseases or challenging climate conditions. However, Gura (2010) notes that this may be creating only an illusion of safety. For example, frozen tissue in gene banks collected from disease-resistant animals cannot keep up with the adaptations that diseases themselves make in the real world.

[10] New breeding technologies, such as cloning, further reduce the livestock gene pool. Moreover, genetic modification present yet more risks to, not just the environment, but also human and animal welfare. See more in, e.g. Gura (2010).

[11] For pork, the number is 91%, and for chicken meat, 89% (Smil, 2002).

Section 5 will give a brief overview of some of the debates about meat. In the meantime, the following sub-section will look at the quantitative data available on meat consumption.

1.2 Brief overview of consumption data[12]

For the secondary data collection in this study, eight EU countries have been selected: Germany, United Kingdom, Italy, Spain, France, the Netherlands, Finland and Hungary. The group of countries has been chosen, on the one hand, as a reflection of a mixture of European countries: middle Europe (Germany, UK, Netherlands), countries which have traditionally had the so called Mediterranean diet (Italy, Spain), France, which has its own 'French paradox' as it comes to diets, Scandinavia (Finland), and Eastern Europe (Hungary). Further, (together with another set of eight EU countries) the Food and Agriculture Organisation (FAO) has meat consumption data dating back to 1961 for these countries, giving therefore the longest trend line available at the EU level.[13]

Section 3 will give a more detailed view at country level, but looking at all the eight countries together, the total amount of meat consumed has doubled in the past 50 years, from about 15 million tonnes to about 30 million tons, and it still seems to be rising slightly (Figure 1a). As for individual meats, Figure 1a shows that there are large increases in the total consumption of especially poultry, but also pig meat, whereas the total amount of beef consumed has been relatively stable for the last 40 years or so.

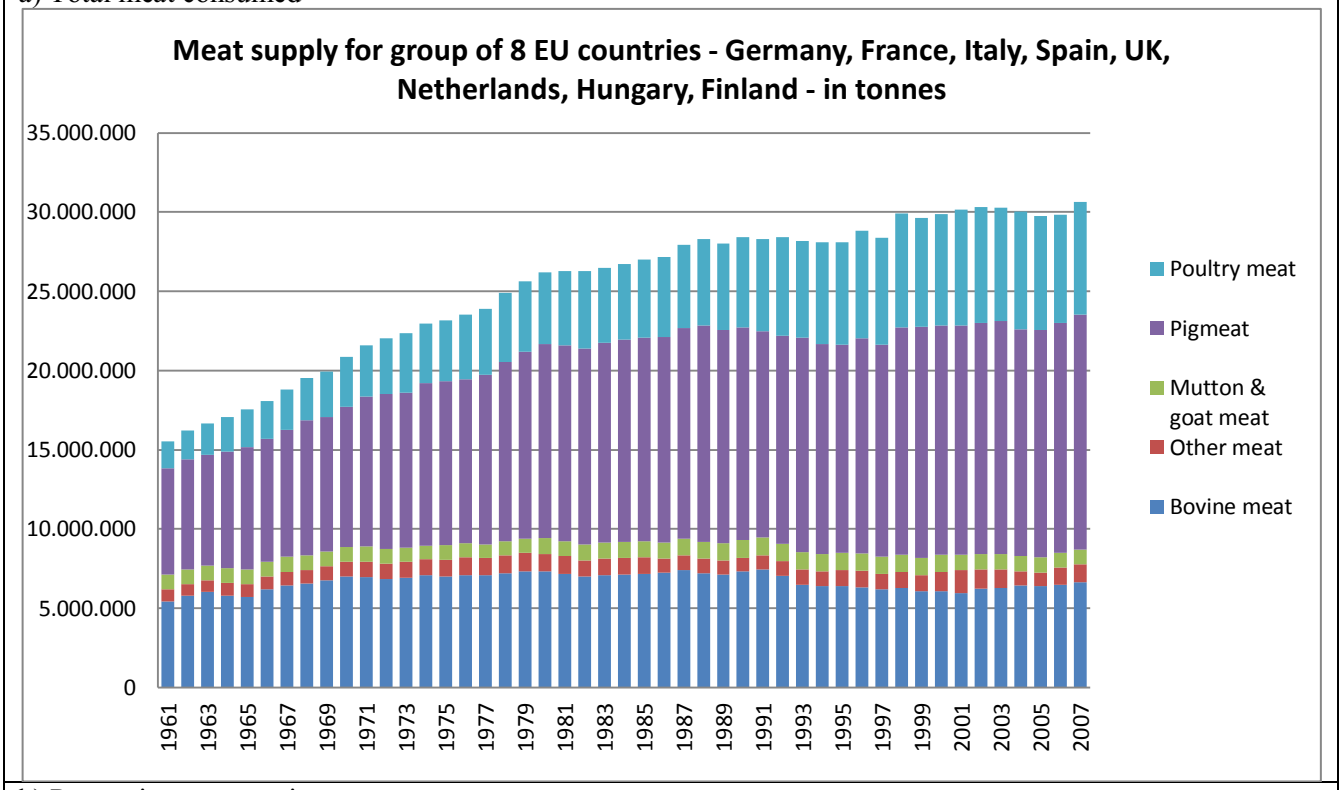
The per capita consumption of all meats has also risen considerably over the last half a century, by almost 70%, but in the last 20 years it has stabilised (Figure 1b). The most recent trend, however, is unknown, as, for example, the recent rises in food prices may have impacted meat consumption from 2008 onwards. Looking at the trend over the 50 years, poultry consumption has increase almost three-fold, and pig meat consumption has risen by 80%, although it has remained fairly stable in the last 20 years. As regards per capita beef consumption, there is an apparent stabilization over the whole observable time period. As a proportion of consumed meat, chicken is eaten much more, and beef much less, now than in 1961 (chicken 25% vs. 11% and beef 21% vs. 34%, respectively), so we can talk about a trend of replacing beef with chicken. Pig meat as a proportion has stayed the same over the time period, and sheep and other meats, consumed only in small proportions overall, have decreased their share slightly, when calculated on a per capita basis.

Average EU-27 per capita supply of meat per day was 236 g (about two thirds of which was actually consumed) in 2007, and in the same year, every EU citizen was 'supplied' with 86 kg of meat on average (of which she/he consumed about two thirds). It must be noted, however, that these average figures include all those (babies and small children, the elderly, and vegetarians) that may not eat very much meat. Therefore, the true amounts *consumed* by regular meat eaters are perhaps close to the higher *supply* numbers.

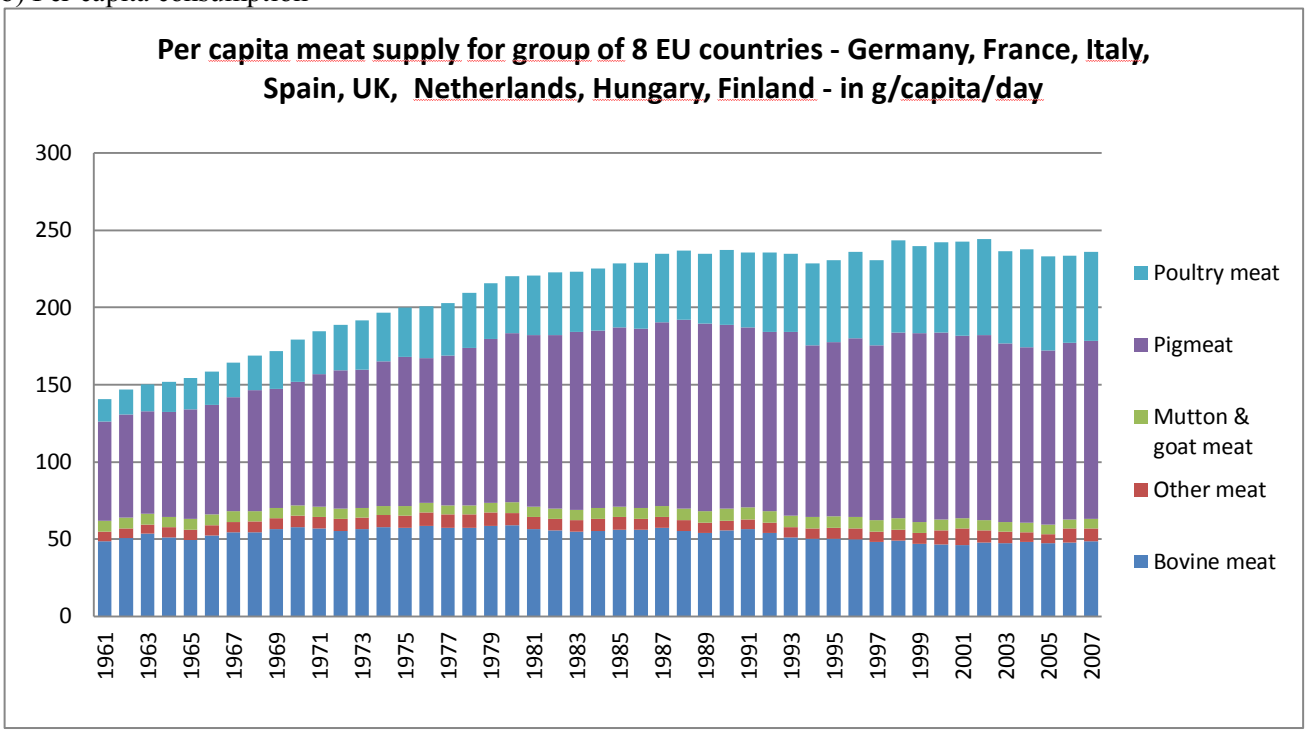
[12] The data used in this sub-section refer to the FAO meat supply data, taken to represent meat consumption as regards trends and differences between EU member states. See Section 2 for details.
[13] Due to the lack of data for some other EU countries, EU-27 totals cannot be calculated for before 1993.

Figure 1. Meat consumption trends since 1961 - Totals for eight EU countries.

a) Total meat consumed



b) Per capita consumption

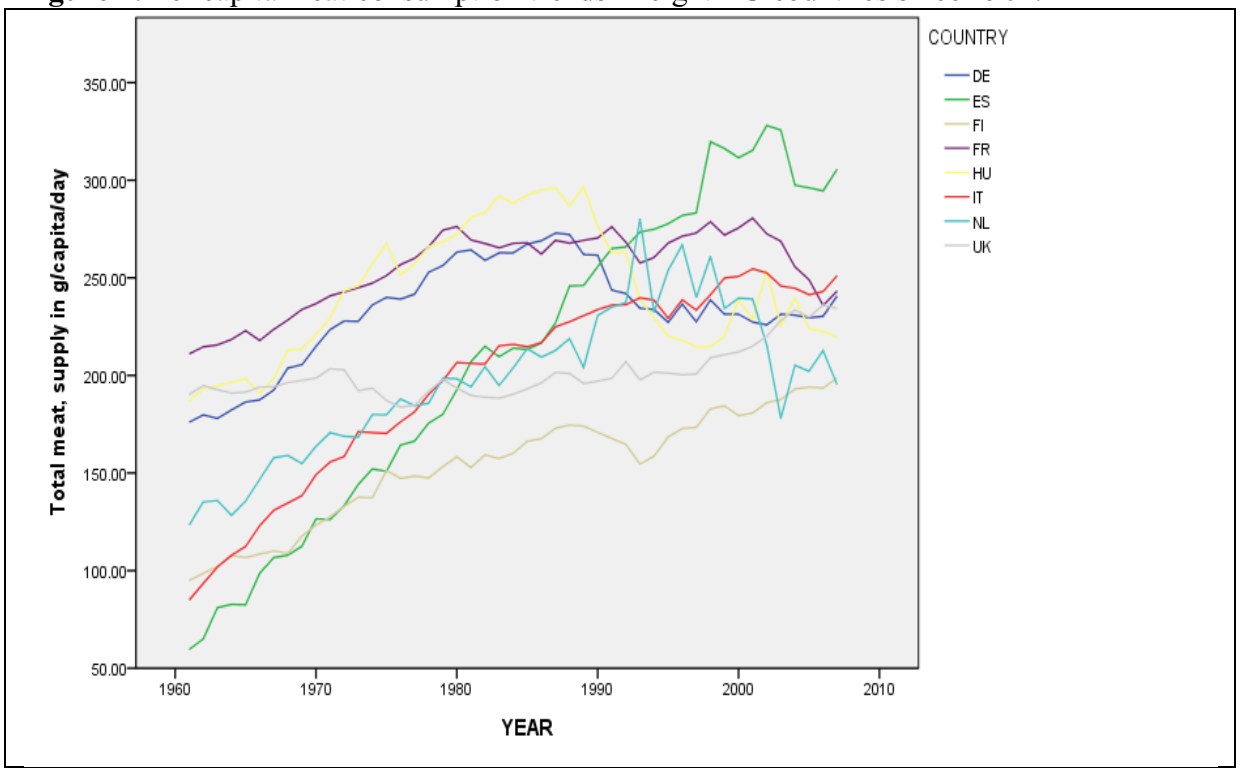


Source: FAOSTAT.

Even though European meat consumption has been relatively stable in the recent past, there is a lot of variation between countries in their consumption patterns. In half of the eight countries examined here, per capita meat consumption has either levelled off (e.g. in France, see Figure 2), or is even in decline until lately, such as in Germany, the Netherlands and

Hungary. But for the UK and for Finland, overall meat consumption is currently rising, and for Spain and Italy the pattern is less clear, as they have both had a recent dip in consumption, after a long term steep rise.

Figure 2. Per capita meat consumption trends in eight EU countries since 1961.



Source: FAOSTAT.

In conclusion, while the *total* meat consumption may still be slightly rising in the examined EU countries, the overall *per capita* consumption of meat has levelled off, however, with much variation between countries. Later in the paper, we will focus more on the per capita data, as the individual level of consumption is important in terms of increasing or decreasing consumption.

1.3 Structure of the paper

The following section will first look at data issues, for example, the difference between supply and consumption in the available data. Also, the sources for meat consumption related data are briefly discussed. Section 3 will go into some detail on meat consumption trends in the eight EU countries selected for this study. Section 4 will explore relationships between meat consumption and issues such as rising standard of living, urbanisation, price of meat, international trade in meat, and social issues, such as the understanding of how much meat we should eat, food scares, and industry influence on our meat consumption levels. Section 5 will conclude and discuss the idea of discourse analysis around the topic of meat consumption. A risk frame of intensive farming and consumption of meat will also be discussed there.

2. Between production, supply and consumption, and other data issues

There are certain differences in how data related to meat production, supply and consumption is presented in various sources and publications, and what the numbers entail.

Perhaps the most relevant issue to discuss here is how losses during the food supply chain (FSC) are dealt with and reflected in the data.

There are large data gaps regarding how much food exactly is lost or wasted in the various FSCs. The national scale research includes, for example, WRAP (2009), Kader (2009), Parfitt et al. (2010), Thönissen (2010) and Luske and Blonk (2009), and FAO (2011) contains estimates of the current situation on a global scale. However, not all the data is comparable, and discrepancies exist.[14] According to the FAO, about one third of all food produced, and more than a fifth of meat, is lost or wasted globally, more or less equally in the global North and the global South. However, for the North, the main losses take place mostly at the end of the FSC, within distribution and consumption. These are defined as 'waste'. On the other hand, in the South, the main losses take place at the beginning and middle of the FSC, in production, handling and storage, and processing and packaging, together defined as 'losses'. For the meat FSC in the North, waste at the consumption level make up about half of total meat losses and waste. For Europe, the specific numbers for losses and waste are:

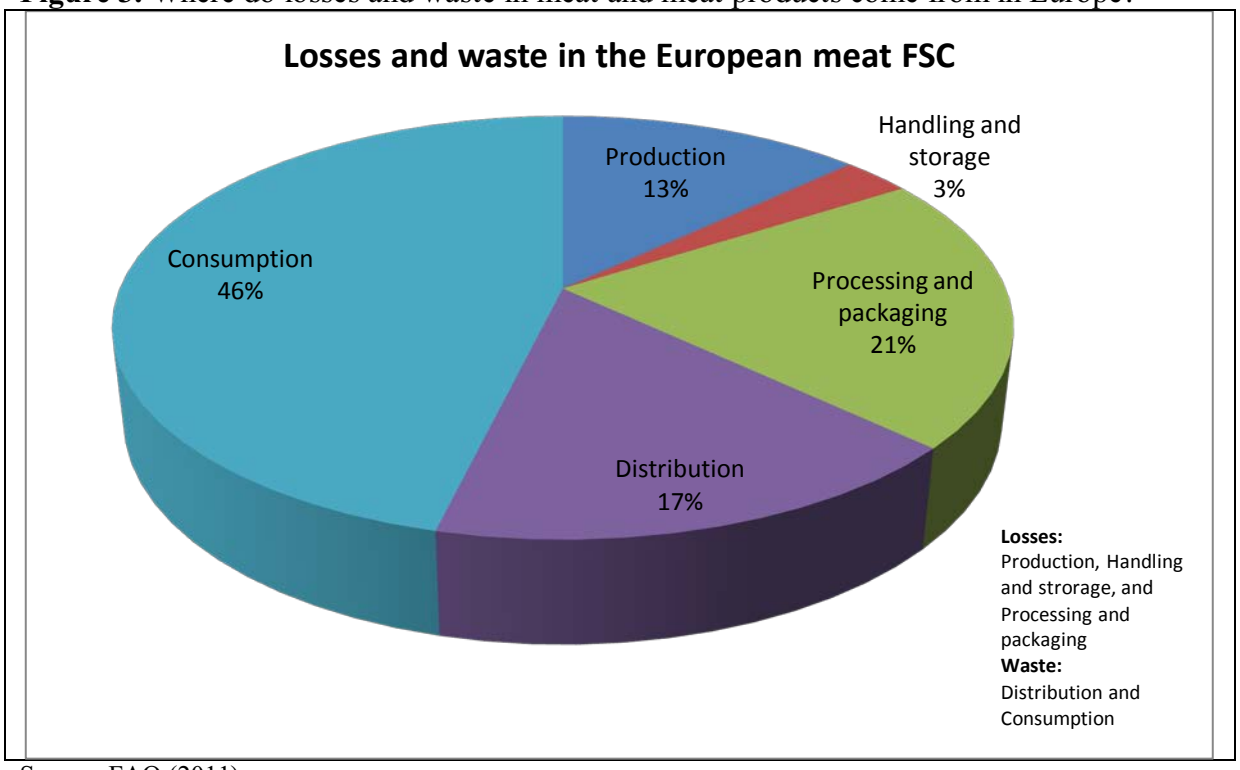
- Losses in meat in Europe: production 3.1%, handling and storage 0.7%, and processing and packaging 5%
- Waste in meat in Europe: distribution 4%, and consumption 11%.

Therefore, according to FAO (2011), as a total, 23.8% of edible meat and meat products are lost in the European FSC for meat and meat products, from the farm to the dinner plate and waste bin.[15] Figure 3 shows visually the contributions from various sources of loss.

[14] For example, Westhoek et al. (2011) use FAO data as a basis for their calculations of losses and *true* consumption, as opposed to the supply numbers being used to represent consumption, as is often the case. However, FAO (2011), using the same FAO data, contains different estimates of true consumption, possibly due to different methodology.

[15] Overall, meat and meat products (together with milk products) are wasted less than other foods. At the opposite end are potatoes, of which as much as about 50% are lost within the FSC (FAO, 2011).

Figure 3. Where do losses and waste in meat and meat products come from in Europe?



Source: FAO (2011).

The FAO (agricultural) meat supply data, used in this paper, takes estimates of at least some of the food losses between production and household into account.[16] The FAO does not, however, include losses during the consumption stage, due to the lack of accurate data up to now. Presumably, also institutional waste occurring at the consumption stage (in restaurants, schools, hospitals etc.) is not accounted for, and it is unclear whether retail waste is included or not. The losses not accounted for may therefore be around 15%.[17] One must also keep in mind, that the consumption data used in this paper refers to the past 50 years in Europe, and the situation may not have always been the same in terms of losses in the European FSC for meat. For example, the consumer share of losses may have been considerably smaller in the 1960's than it is now. But considering that the total losses (i.e. losses and waste together) are currently more or less equal between developmentally very different countries in the world, it could perhaps be assumed that the total losses in the FSC were not far 50 years ago in Europe from what they currently are. In other words, 50 years ago, the consumer share was likely to be much smaller, but on balance, the share of the beginning of the European FSC, for example, may have been somewhat larger than it is now.

[16] Other sources of meat consumption related data include other statistical agencies with agricultural supply data (e.g. Eurostat), household budget surveys and individual dietary surveys. How losses and waste are taken into account varies.

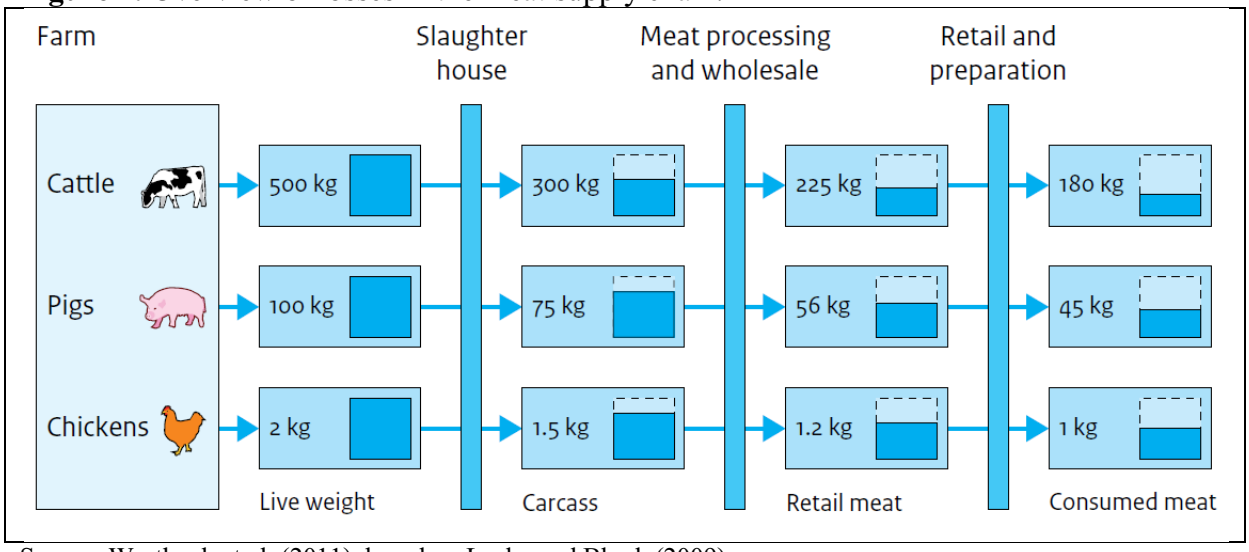
[17] FAO defines 'food supply' as estimates of food supplies available for human consumption, and remark that 'it is important to note that the amount of food actually consumed may be lower than the quantity shown [...], depending on the degree of losses of edible food and nutrients in the household, e.g. during storage, in preparation and cooking etc.' (http://faostat.fao.org/site/375/default.aspx, accessed 20 October 2011)

The FAO meat data refers to raw meat. Other sources for meat consumption data, for example small scale surveys, may refer to cooked meat and/or they may include e.g. consumer waste, and so, the numbers have to be viewed case by case, and comparisons made with care.

Further, it should be noted that the FAO include much of the bone in their meat supply data.[18] Therefore, probably at least another 15% should be deducted to get the actual amount of meat eaten. However, different animal species, different types of the same farmed species, and different cuts of the very same animal all have different quantities of bone in them.[19] This makes it difficult, without further information, to get precise estimates of how much bone the FAO meat supply data includes.[20]

Figure 4 gives an estimation of the losses in the FSC for Dutch farm animals.

Figure 4. Overview of losses in the meat supply chain.



Source: Westhoek et al. (2011), based on Luske and Blonk (2009).

In much of the literature using the FAO data, 'supply' is taken to represent 'consumption', and the latter word is used mostly also in this paper without making adjustments to the supply figures. This paper is more concerned with comparing European countries with each other and looking at trends over time, than the actual amounts of animal protein consumed, and therefore such deductions to the FAO data are not made. However, if one wants to know how much the actual average consumption is, based on the supply figures, roughly a third should be deducted from the supply data.

Finally, it is important to note that the term 'supply' refers to domestic supply, which covers the domestic production of meat, supplemented by imports, and reduced by exports, plus any

[18] According to Westhoek et al. (2011), the FAO data is expressed in carcass weight at slaughterhouse exit level.
[19] Westhoek et al. (2011) gives a rough estimation of a live cow consisting of about 45%, a pig 55%, and a chicken 60% of edible meat.
[20] According to Westhoek et al. (2011), the actually consumed meat is about 60-67% of the FAO meat supply data. This may be consistent with FAO (2011), if the FAO use different figures in this 2011 publication for the calculation of losses and waste (e.g. they take out the bone weight) than in the FAOSTAT supply data (which supposedly includes most of the carcass bones).

changes in stocks. Further, re-exports - whereby foreign goods are exported shortly after being imported, remaining in the same state[21] as when imported - are also taken into account in the FAO export data.

[21] The 'same state' may include minor processing, as long as this does not change the origin of the product.

3. Differences and similarities in consumption trends over 50 years[22]

This section takes a closer look at the meat consumption in the selected eight EU countries and individual types of meat, namely bovine meat, poultry meat, pig meat, and sheep and goat meat. It is not intended in this section to look for reasons for the trends. This topic is discussed in the next section, although, the causes are often complex, and the contribution of individual factors is difficult to determine with certainty.

Figure 5a shows that the per capita consumption of *bovine meat* (cows and buffalos, but overwhelmingly cows) has mostly been either in decline in the recent past, or fairly stable, and for most of the eight countries this is true for the entire half a century of data. The only exceptions for the current trend are Spain, where bovine meat consumption is rising, and the UK, where the rising trend possibly reflects a recovery after the BSE crisis in the 1990's. For Germany, a deeply decreasing trend has lately been reversed and bovine meat consumption seems to be on the rise.

The per capita consumption of *poultry meat* (covering chickens, turkeys, ducks, geese and guinea fowl, although most consumption is chickens), shown in Figure 5b, has mostly been increasing across both the time frame of 50 years and the eight countries, but in the last ten years, there have been some steep dips in Hungary, Spain and France, and a longer term decreasing trend in Italy. For the Netherlands, a sharp 10-year decrease from the mid 1990's onwards was followed by a peek in the early 2000's.

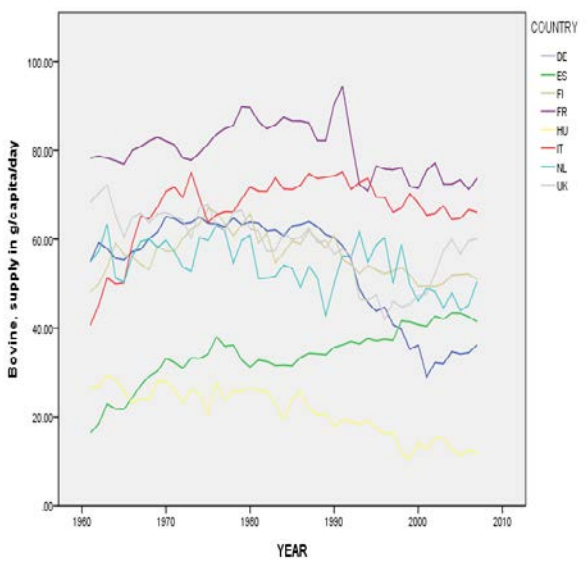
Figure 5c shows the trends in *pig meat*, and it can been seen here that the overall trend is also of increasing per capita consumption until about 1990, although the upward trend has been less sharp than with poultry meat. In the last 20 years or so, there have been fairly sharp decreases in the consumption of pig meat in the Netherlands and in Hungary. Germany, Finland and France show stabilisation, and in the UK pig meat consumption has been stable throughout the last half a century. Only in Italy and Spain is pig meat consumption clearly increasing.

The consumption of *sheep and goat meat* (Figure 5d) has mostly been very low, but fairly stable throughout the observable time period in Europe. The bigger consumers in the group of eight countries are the UK, Spain and France. Out of these, the consumption of sheep and goat meat has been in continuous decline in the UK.

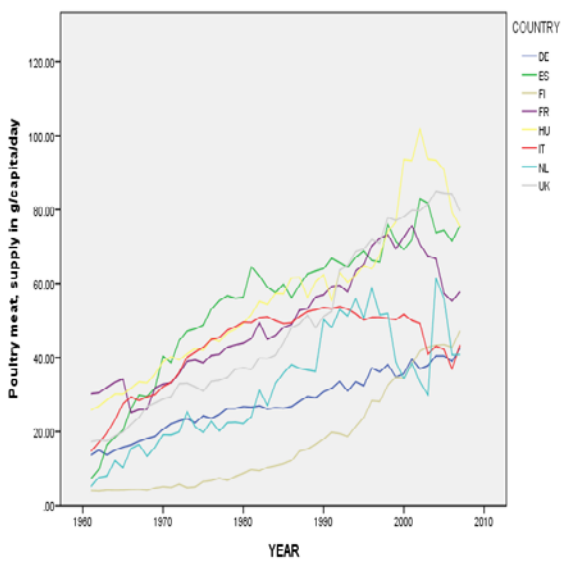
[22] The data used in this section refer to the FAO meat supply data, taken to represent meat consumption as regards trends and differences between EU member states. See Section 2 for details.

Figure 5. Per capita country consumption trends for different meats in eight EU countries since 1961.

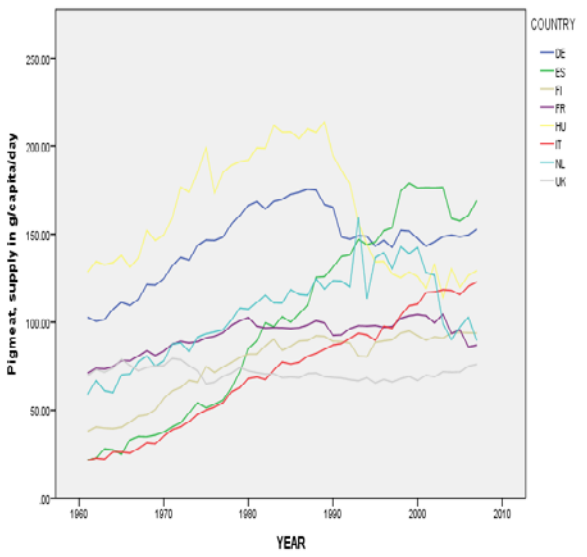
a) Bovine meat



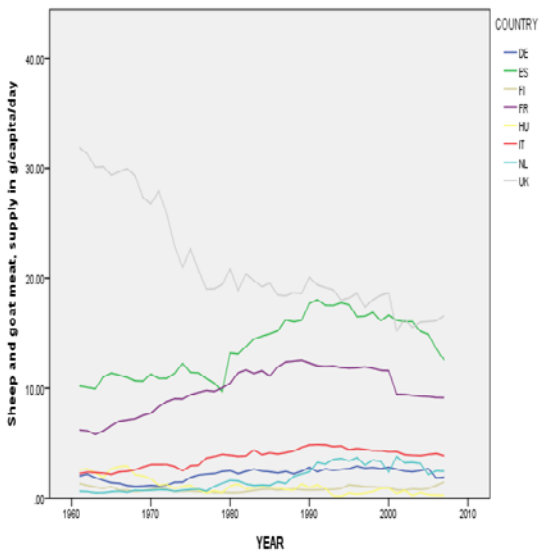
b) Poultry meat



c) Pig meat



d) Sheep and goat meat



Source: FAOSTAT (meat supply data).

To highlight the fact that different European countries do have large differences in their meat consumption patterns, two country cases are taken next. Figure 6 shows the per capita consumption of all types of meat for Spain (Figures 6a and 6b) and Germany (Figures 6c and 6d) for two points in time, and in comparison with the EU average (100). Firstly, for 1961, which is the first year with FAO consumption data, and secondly, for 2007, which is currently the last year with available FAO data.

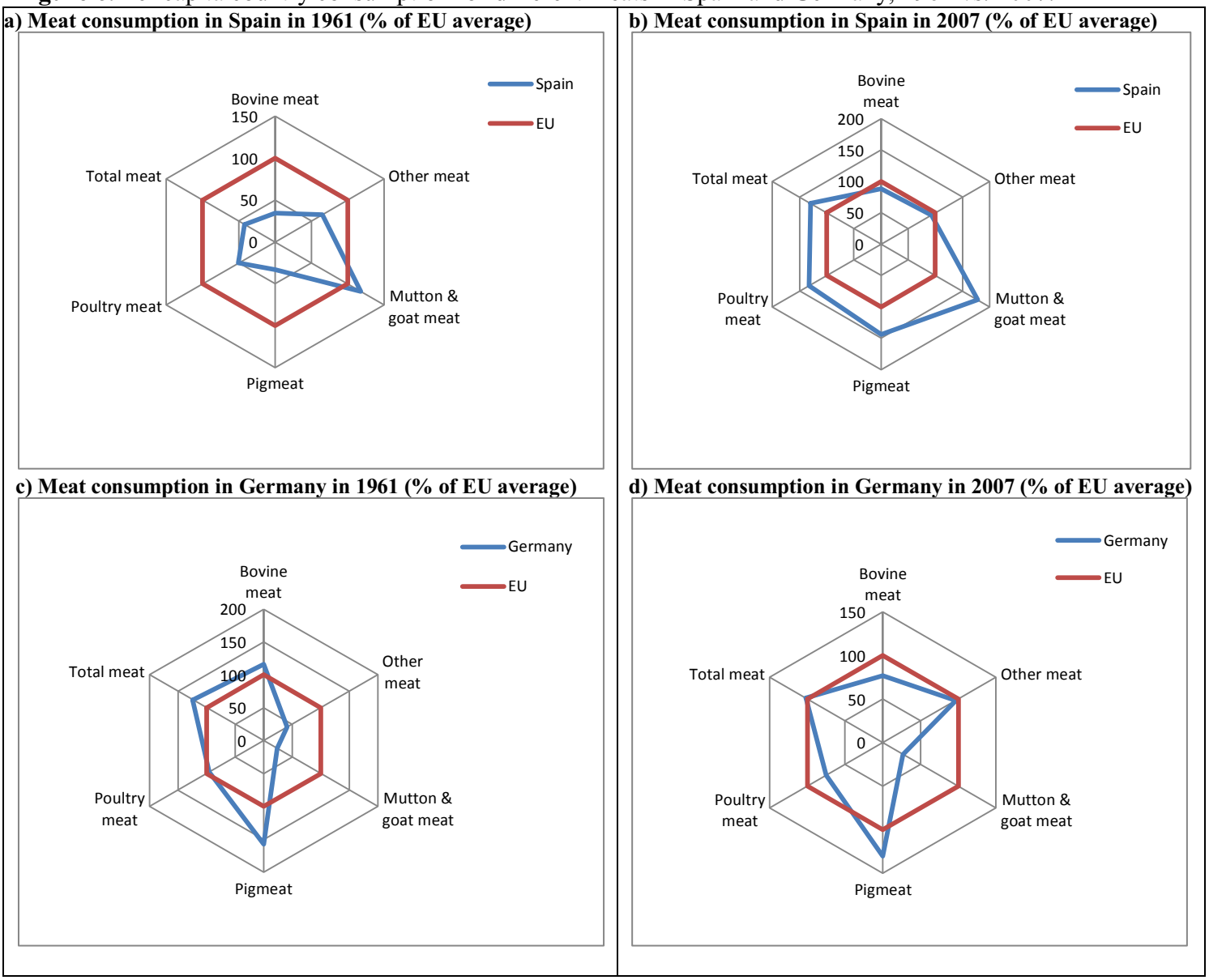
As can be seen, Spain's per capita consumption of meat was very low in 1961, along the lines of the Mediterranean diet, and less than half of the average in the EU. The 'Mediterranean diet' refers to food consumption patterns typical of some Mediterranean regions in the early 1960s, such as Crete, other parts of Greece, Spain, southern France, and southern Italy. The

diet emphasizes relatively low consumption of red meat, among other things (Tyrovolas and Polychronopoulos, 2011). In 2007, however, the consumption of meat in Spain was well above the EU average for all main types of meat, except for bovine meat, and the total consumption was also well above the average in the EU. So, a clear shift away from the more traditional diet can be seen in Spain.

On the other hand, in Germany, meat consumption was clearly above the EU average in 1961, especially due the large consumption of pig meat, but also of bovine meat. However, in 2007 the total meat consumption by Germans was at the EU average, although this fact conceals changes in the relative consumption of different meats. Germans still ate a lot, although less, of pig meat in 2007, but their consumption of bovine meat had come down radically to well below the EU average. A similar, but less strong decrease between 1961 and 2007 can be observed with the consumption of poultry meat relative to the EU average.

Finally, the patterns of consumption of the main types of meat, in other words, the shapes of the hexagons in Figure 6, have stayed relatively stable for these two countries, and especially for Germany.

Figure 6. Per capita country consumption for different meats in Spain and Germany, 1961 vs. 2007.



Source: FAO (meat supply data).

In conclusion, this section has briefly shown that there has been a lot of variation in the consumption of various meats between European countries over time. The next section will look at the possible influences on meat consumption.

4. Exploring relationships[23]

This section will look at a number of factors which could in theory have an impact on meat consumption. It is, however, difficult to point to definite causes for certain patterns of consumption by looking at quantitative macro level data. Many complex factors are normally involved, and only stronger or weaker correlations can be found with these means, if anything.

4.1 Standard of living

For most of the EU countries, including the countries chosen for this study, standard of living, as measured by GDP (gross domestic product) per capita, has been generally rising together with per capita meat consumption during the period of observation and available data, i.e. from 1970 onwards. This is the case especially for poultry meat, but overall, the correlations between **GDP per capita** and meat consumption in the EU are not so strong. But in the group of the eight EU countries under examination here, there are two exceptions, Finland and Italy (see Figure 7). In these countries the correlations are very strong (0.975 and 0.976, respectively[24]) for total per capita meat consumption, as well as for two specific meats: poultry for Finland (0.975) and pig meat for Italy (0.993).

Overall, as, for example, Westhoek et al. (2011) note, rising prosperity seems to have an impact on rising levels of meat consumption.[25] Similarly, York and Gossard (2004) observe a clear positive effect of GDP per capita (as one indicator of modernisation in their case) on meat consumption. However, meat consumption seems to increase with income according to an S-curve (Keyzer et al., 2005). This curve may have already levelled off in Europe, which would be in line with the recent fairly stable consumption trends. Smil (2002) argues that past dietary transitions that countries go through over time have always included a shift towards higher consumption of animal products. However, Pradhan et al. (2012) conclude from their study (with data for the past half a century) that a move towards a high meat diet cannot clearly be seen as the only such pattern, and for some countries, dietary patterns have changed towards a lower meat consumption diet.[26]

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[23] The data used in this section refer to the FAO meat supply data, taken to represent meat consumption as regards trends and differences between EU member states. See Section 2 for details.

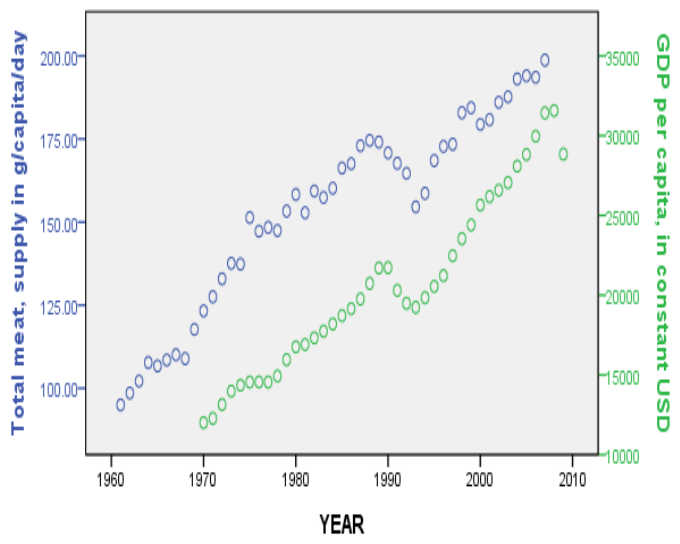
[24] The correlations in this paper are calculated as Spearman's rho, except for the correlations with urbanisation (Section 4.2), which are Pearson correlations.

[25] However, Westhoek et al. (2011) argue that the link between prosperity and consumption may not hold for the consumption of pig meat, which may be linked more to cultural and supply factors.

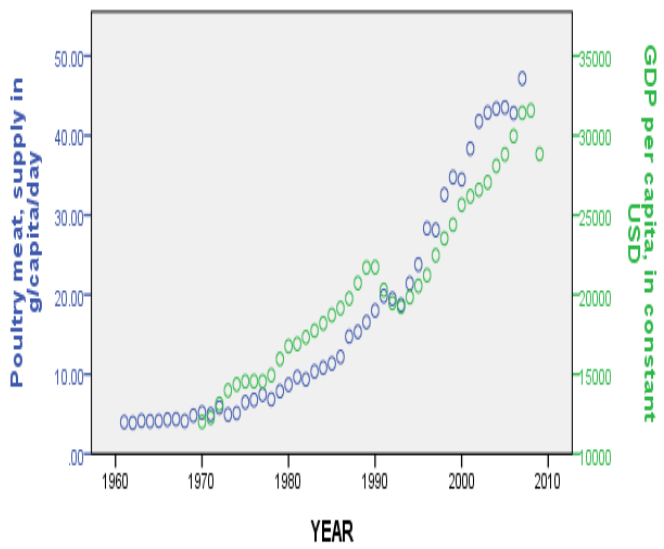
[26] Growth in tourism can be seen as a development related to the increased standard of living. For example, could tourism explain the steep rise in meat consumption in Spain, either due to rise in direct consumption or a change in the eating habits of the local population? The World Travel and Tourism Council provides data on inbound tourism expenditure, i.e. spending within the country by international businesses and leisure tourists from the late 1980's onwards, and this data does not show any obvious relationships. Unfortunately, the data does not extend far enough in time to make any firm conclusions about the (non)existence of correlations between tourism and meat consumption. For Spain, tourism in 2007 was about 30% higher than in 1988, and this is comparable scale growth as in meat consumption in Spain. However, the bulk of the meat consumption growth took place in the 1960's, 1970's and early 1980's, and since there is no available tourism data for this time period, not much more can be said about the relationship between these two variables for Spain. Additionally, in the time period with data, the Spanish tourism growth has been, in fact, less than for many other European countries where meat consumption has not risen so steeply.

Figure 7. GDP per capita vs. meat consumption from 1961 - Finland and Italy.

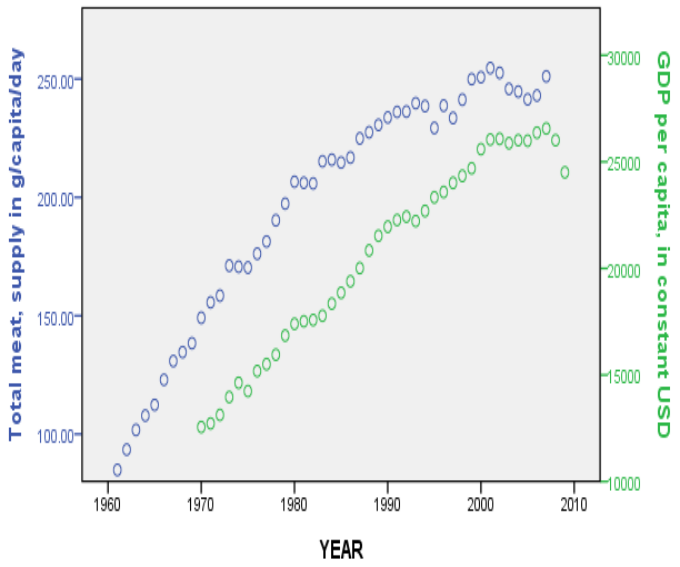
a) Finland – GDP per capita vs. total meat consumption



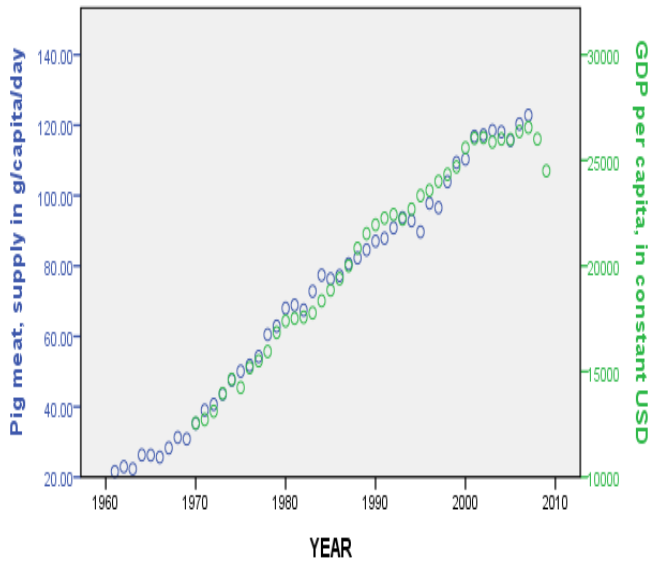
b) Finland – GDP per capita vs. poultry meat consumption



c) Italy – GDP per capita vs. total meat consumption



d) Italy – GDP per capita vs. pig meat consumption



Source: OECD, FAO (meat supply data).

To conclude, the standard of living seems to affect the levels of meat consumption in most of the observed countries, especially with poultry consumption. This result is also supported by literature.

4.2 Urbanisation

Rivera-Ferre (2009) note that the **degree of urbanisation** is generally considered to be strongly related to increased meat consumption, through changes in lifestyles and diets, both in the global North and increasingly also in the global South. For example, double-income families, supermarkets and convenience meat products are linked to urbanisation, and indeed,

the tripling of the consumption of poultry in the eight EU countries over the last half a century may be partly due to the convenience factor (Westhoek et al., 2011). Anderson and Shugan (1991) observed twenty years ago that the *perceived* (but not actual) high convenience, rather than healthiness of chicken was the main contributor for the shift from beef to chicken at that point in the United States.[27] Similarly, Schroeter and Foster (2004) find that the higher the share of women in the workforce, the higher the consumption of chicken (and fish, which is also usually quick to prepare) in the US.[28] With hard data for 132 countries, the regression results of York and Gossard (2004), for example, indicate that urbanisation generally does increase total meat consumption. They however, also emphasize that different geographical regions have had different impacts from modernisation (see more in Section 5.1).

Indeed, from our data for the eight European countries, it can be seen that in many cases urbanisation is strongly correlated with increases in meat consumption (see Figure 8 for some examples), although this is less the case at the level of total meat consumption.[29] Especially in Spain, and also in Italy, this relationship is, however, very strong. These are, interestingly, also the only countries among the eight, where beef consumption is significantly and positively related to urbanisation. Mostly beef consumption seems independent of this factor. On the other hand, in all but one (Finland) of the eight countries, chicken consumption is positively and significantly correlated with urbanisation. Further, the only significant *negative* correlations are found for Hungary, in beef and sheep meat, and for the UK in sheep meat. Since the UK has traditionally been a relatively strong consumer of sheep meat, it seems plausible that when people move away from the countryside, such traditions might also start to die down. Overall however, the UK seems to have the least correlation between urbanisation and the consumption of meat.

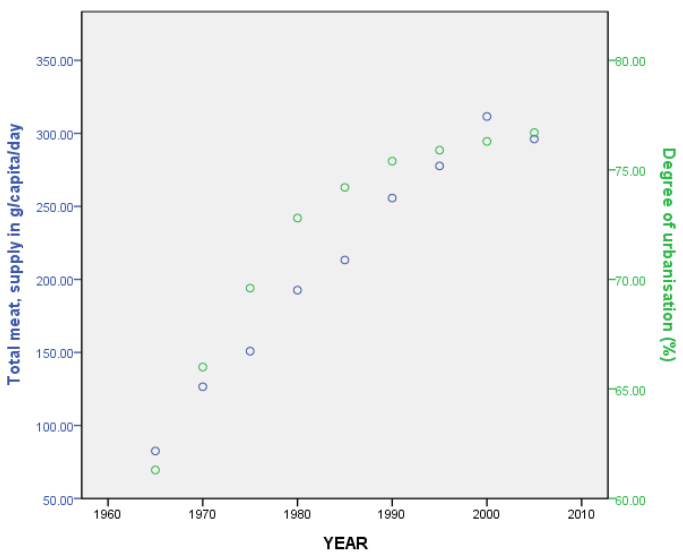
[27] Compared to chicken, beef usually requires a much longer cooking time. Westhoek et al. (2011) note that, in addition to other reasons, this may have contributed to the stagnating consumption of beef in Europe over the past decades.

[28] It seems that, in general, women tend to prefer white meats over red meats (e.g. Kubberod et al., 2002).

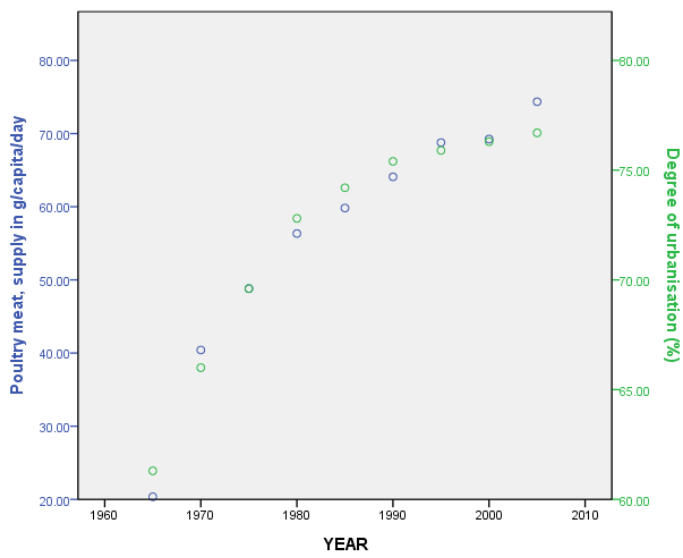
[29] The data for urbanisation are sparse (only for every five years), although it extends to the same time period as the data for meat supply. Therefore, any correlation results should be interpreted with caution.

Figure 8. Degree of urbanisation vs. meat consumption from 1965 - Some examples.

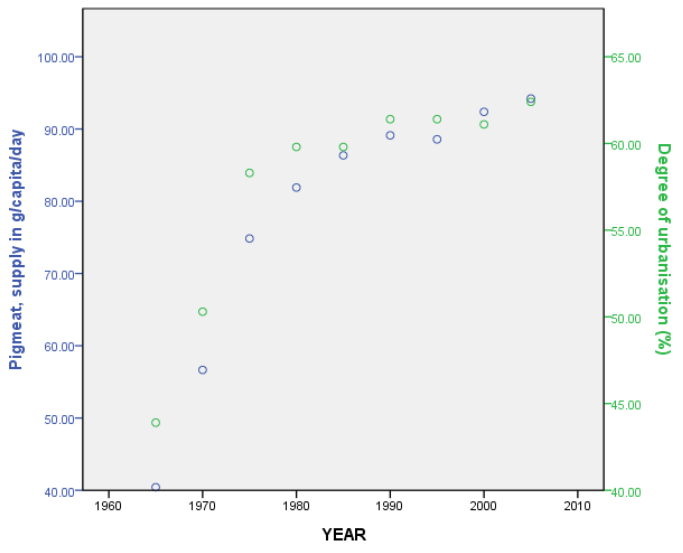
a) Spain – Urbanisation vs. total meat consumption



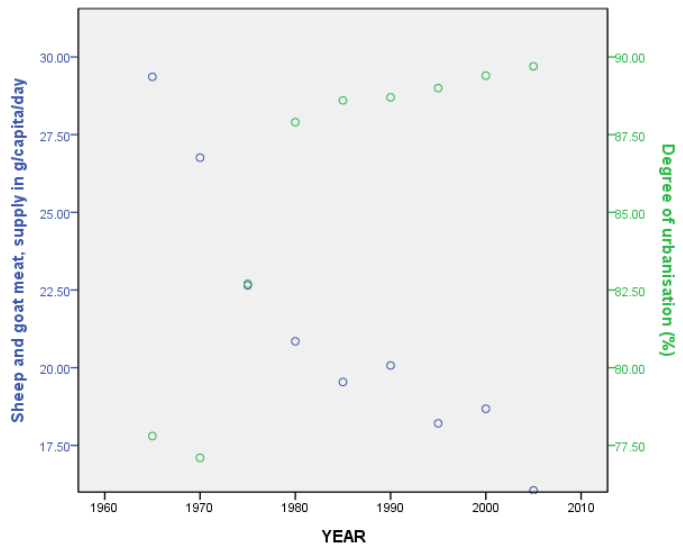
b) Spain – Urbanisation vs. poultry meat consumption



c) Finland – Degree of urbanisation vs. pig meat consumption



d) UK – Degree of urbanisation vs. sheep meat consumption



Source: World Bank, FAO (meat supply data).
Note: Urbanisation is measured by the share of people living in urban areas, as defined by national statistical offices.

So, it seems that our data gives some support to the literature that links increased meat consumption with urbanisation, although it seems to be more true at the level of certain individual meats, such as chicken, rather than the total consumption of all meats.

Rivera-Ferre (2009), however, argues that the relationship between urbanisation and increasing meat consumption is not as simple as it might seem, and it is only one aspect in the expansion of industrial meat production. Section 4.4 will get back to the relationship between intensive agribusiness and meat consumption.

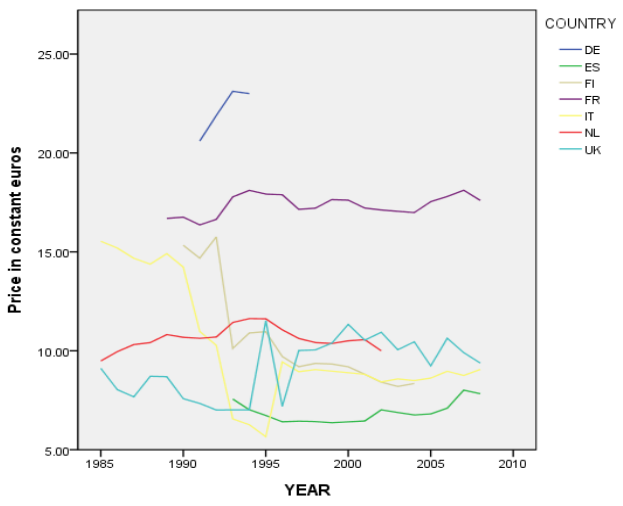
4.3 Cost factors

The price of meat has generally come down in the last half a century with increased factory farming, but when adjusted with a food CPI - consumer price index for food, i.e. comparing changes in the price of meat to the changes in the average price of all food items - the trend is not so clear. Figure 9a shows the trend for beef price in seven (out of the eight) EU countries since 1985, and it can be seen that, apart from Italy and Finland, beef is, relatively speaking, not cheaper than it was 25 years ago. Similarly, there is no significant downward (or upward) trend for pork or lamb. However, as Figure 9b shows, a clear relative fall in prices can be seen with chicken, especially in the early part of the observed period. Westhoek et al. (2011) note that the sharp fall in chicken prices in the last half a century is in large part due to the introduction of the fast growing broiler chickens to Europe in the 1950's, together with new feed and more efficient housing techniques, in other words, industrialisation of the poultry production.

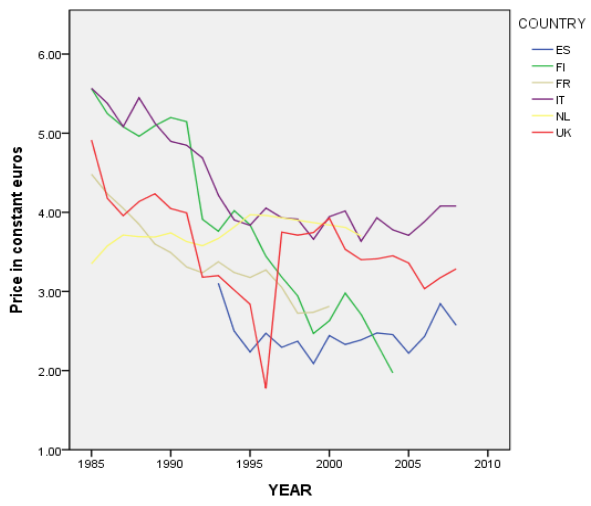
It could be assumed that, in many cases, the lower the price of a product is, the more people will buy it. Many (e.g. Rivera-Ferre, 2009; Westhoek et al., 2011) argue this to be the case with meat as well, in particular with lower income population segments, and more generally, in the global South. However, De Bakker and Dagevos (2011) note that the relationship between price and consumption of meat is not always obvious, as there are usually more than one factor affecting people's food choices, and cultural factors, for example, also have a lot to do with food choices.

Figure 9. Retail price trends for beef and chicken in some EU countries since 1961.

a) Retail price per kilo of beef without bone



b) Retail price per kilo of cleaned chicken



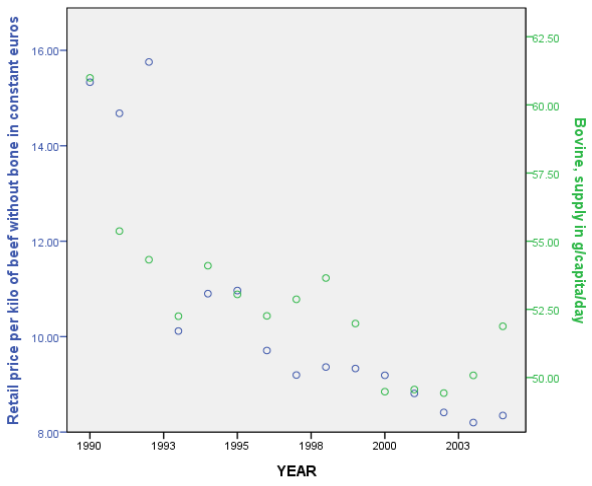
Source: FAO, ILO and OECD.

Looking at data for the group of EU countries under investigation in this paper, there is indeed somewhat more negative correlation than positive. This would give some, although weak, indication of lower prices making people consume more meat. However, for most of the eight EU countries, there is no clear pattern one way or another. Finland is perhaps an exception - together with Hungary - among these EU countries, in that the correlations between the price

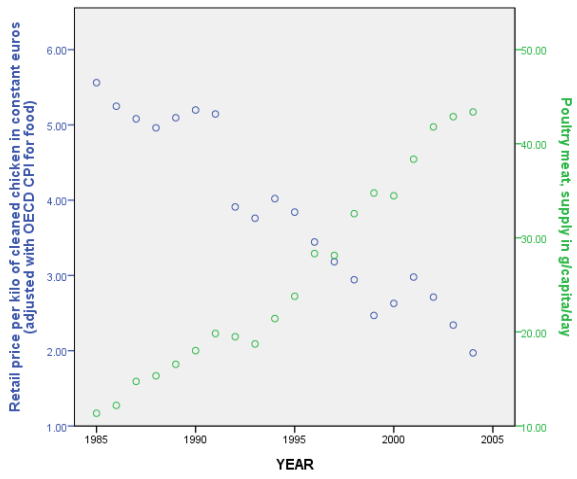
of beef and chicken and the consumption of these meats are fairly strong during the time period from 1985 to 2005 (see Figures 10a and 10b). However, as can be seen, the correlation is clearly positive for beef, and negative for chicken. So, it could be that, in Finland, beef consumption has been going down regardless of the price of beef, but with chicken, price may have influenced consumption.[30] According to Rivera-Ferre (2009), similar observations can be made for the US from 1955 to 1995, where the consumption of chicken was affected by price, but the consumption of beef (and pig meat) was not.

Figure 10. Retail price for meats vs. consumption since 1961 - Finland.

a) Finland – beef price & consumption



b) Finland – chicken price & consumption



Source: FAO (meat supply data), ILO and OECD.

Another way to look at the cost of meat is to find out **how long an average person has to work to earn enough to buy a kilo of meat**. Figures 11a and 11b show the situation from 1985 onwards for beef and chicken, for five of the eight EU countries under investigation here. From the figures, it can be seen that for beef, there is a reduction in the necessary time, but it is not so clear for all of the countries. There is, however, a large difference between France and the other countries, in that the French have to work for about twice as long as the rest (almost 1.5 hours) to buy their kilo of beef. For chicken, the necessary time came down strongly during the 1980's and 1990's for all of the countries with available data, so that an average worker in 2000 needed to work approximately only half the time (15 minutes or less) he or she had to work in 1985. In the 2000's, there was not much change.[31, 32]

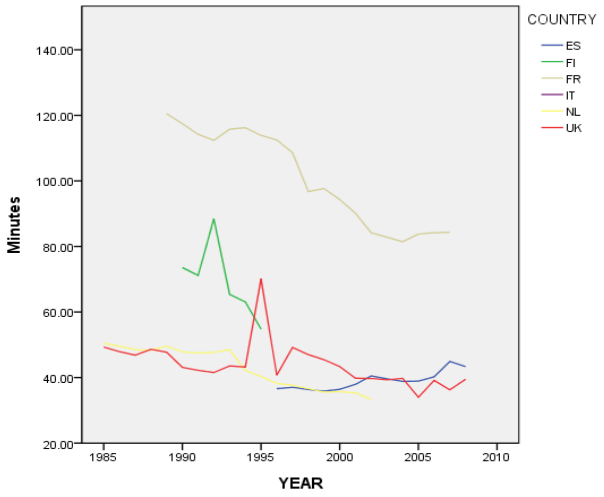
[30] In theory, it could also be, of course, that people buying more chicken bring the prices down, and not the other way around.

[31] For lamb, the situation is similar to beef, and for pork it is similar to chicken.

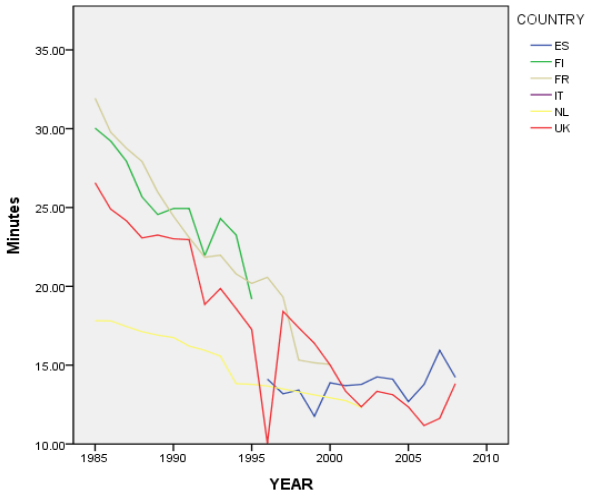
[32] Figure 11 suffers from lack of longitudinal data for some countries, but the trend is still fairly clear, especially for chicken.

Figure 11. How long an average worker has to work to earn enough to buy a kilo of meat in some EU countries (no taxes considered).

a) Beef without bone



b) Cleaned chicken



Source: ILO and OECD.

It is also interesting to see whether the working time is correlated with the consumption of meat. In most of the eight EU countries with data for working time, there does not actually seem to be any overall correlation, although the data is quite spotty (on average, there is data only for about 15 years for each country with data) and therefore, it is difficult to see any trends. But there is significant negative correlation between the necessary working time and chicken consumption in several countries - e.g. in Spain, Finland, and the UK. In other words, it could be said that the less you have to work to earn your chicken meat in these countries, the more you will eat it. Additionally, in the UK, pork and sheep meat consumption have come down together with the time needed to earn enough to buy them, indicating that there may have been other, stronger influences on pork and sheep meat consumption.

Marí and Buntzel (2008) argue that the developments in the chicken industry in the last half a century or so – the concentration, the globalisation, the industrialisation - have no parallels in any other food products. The nature of chicken meat price developments, as compared to other meats, certainly supports this. Similarly, the steep rise in chicken consumption over other meats in many European countries in the last 50 years, observed in Section 3, has also been in line with the increasingly industrial nature of the chicken meat production. The next section discusses the overall impact of increased industrialisation of meat production.

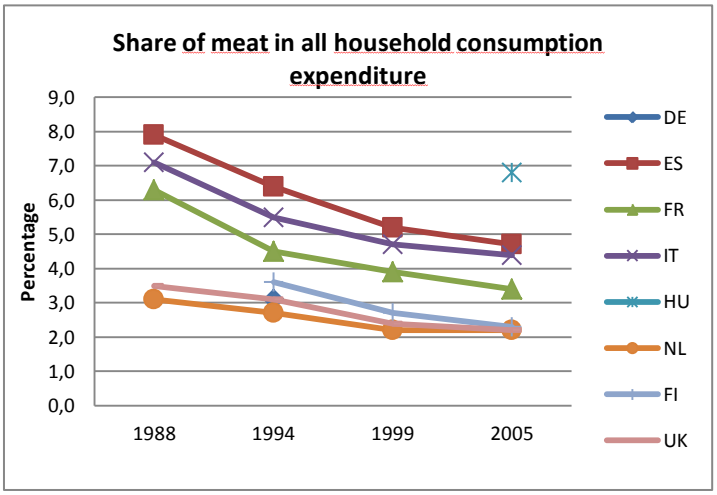
Further, although the data again does not go back very far, there is a clear downward trend on expenditure on meat as a proportion of all household consumption expenditure (Figure 12a) for those of the eight countries for which there is enough data. Westhoek et al. (2011) note that household expenditure on food in general is, and has been, also linked to culture. Southern European countries have traditionally spent considerably more money on food as compared to Northern European countries, food also occupying a more central place in people's lives in Southern Europe, as opposed to Northern Europe, where only in the last half

a century food's cultural position has gradually gained importance (see also Mennell, 1985, Jobse-van Putten, 1995, and Teuteberg et al., 1997, in van Otterloo, 2012). De Boer et al. (2006) link this further to the contribution of religion to food culture, as their study indicates that Catholic countries in Europe have spend more money on meat than Protestant countries, with the Catholic culture appreciating meat specifically as a culinary pleasure. Figure 12a shows indeed clearly that the proportion of household money the Spanish, Italians and French have spent on meat is bigger than what the British, Dutch or Finns have spent, although the gap is much smaller for the 2000's than it was for the 1980's. A gradual change, or convergence of eating habits in different countries (the 'Westernisation' of them) could be behind the change.

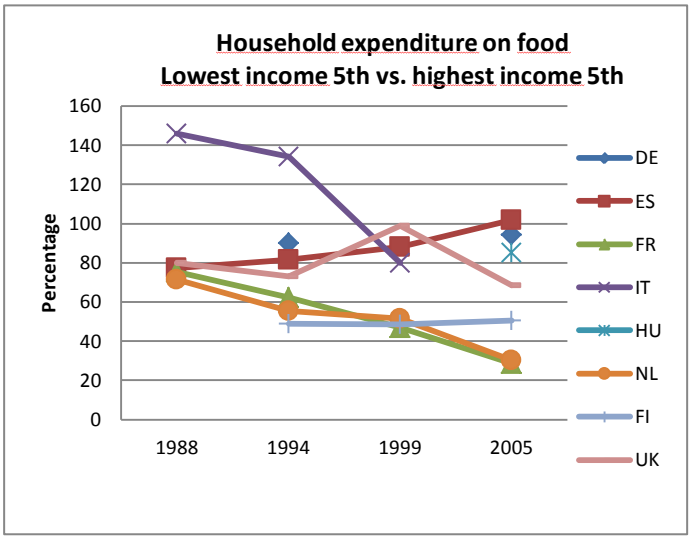
As regards how much more lower income groups spend on food as compared to higher income groups (Figure 12b), there is a downward trend for some countries, but not all, especially not Spain. In other words, lately, the richest Spanish households seem to be spending relatively less on food, as compared to the poorest households, than they did 20 years earlier. Or vice versa, the poorest households have been spending relatively more lately.

Figure 12. Household expenditure trends since 1988 in some EU countries.

a)



b)



Source: Eurostat and OECD.

To conclude, the price of meat does seem to have some effect on meat consumption, as argued in at least some of the literature, but our data does not give as much support as with the standard of living or with urbanisation.[33] There is also much variation between countries, and also between different meats, with the data for chicken and beef behaving opposite from each other.

[33] The price-related data is also not as long term as that for the previous two sub-sections.

4.4 Industrialisation of production

Rivera-Ferre (2009) makes a strong case for the relationship between supply and demand to be the opposite from what is generally assumed, when she discusses recent and future trends in meat consumption. Similarly, e.g. Marí and Buntzel (2008) question the demand/supply relationship in meat. According to Rivera-Ferre, demand for meat is strongly influenced by supply, i.e. the intensification, or industrialisation of meat production, which then leads to price decreases. In other words, the intensification of meat production has created the markets that consumers have adjusted to. Rivera-Ferre also argues that the expansion of industrial meat production to the global South is driven by large multinational companies and by development agencies that see industrial meat as a solution to both malnutrition and increased economic development in the global South.

On the other hand, food retailers have in recent years shown that they can be proactive towards more sustainable practices as well. For example, in the UK, a number of food retailers have taken a leading role in moving towards sustainability, e.g. in publishing 'carbon footprints' on their products (Oosterveer, 2012).[34] This of course, need not mean that present day retailers would want people to consume less; rather, they are responding to pressures to be more aware of the externalities of consumption.

Spaargaren et al. (2012) also argue that consumers are an important part of the equation, and that, although they have less power than the industry, together with producers and retailers, they have co-shaped modern consumer practices and preferences, and they can continue to do so in the future, their agency therefore possibly helping to create a more sustainable food system. With chicken in particular, Marí and Buntzel (2008) note that the industrialisation of production has greatly affected the quality of the meat, but until now, most consumers in the global North at least, do not, however, seem to care about this, perhaps because of the convenience aspect of the industrial chicken.

One way to measure the growth of the industry, is to see the developments at the farm level, e.g. **the growth of large holdings of production animals**, with chicken perhaps being the most industrialised farm animal, and therefore, most interesting to look at. Unfortunately, there is not enough data to look at the developments in the chicken industry over a longer time period for the eight EU countries in question. However, there is some data for the last two decades, and most remarkably, in the Netherlands, the proportion of so called large holdings (with at least around 70,000 chickens on one farm)[35] has grown from around 10% to around 30%. The other seven countries have had a much more modest development.

Figure 13 shows the developments in average number of cattle and pigs per one holding, for which there is data available from the early 1970's. No data for poultry of sheep exists in Eurostat. It can be seen from Figure 13a that all the eight countries have had similar growth trends in cattle holdings, with the smallest average holdings found in Hungary, Spain, Finland

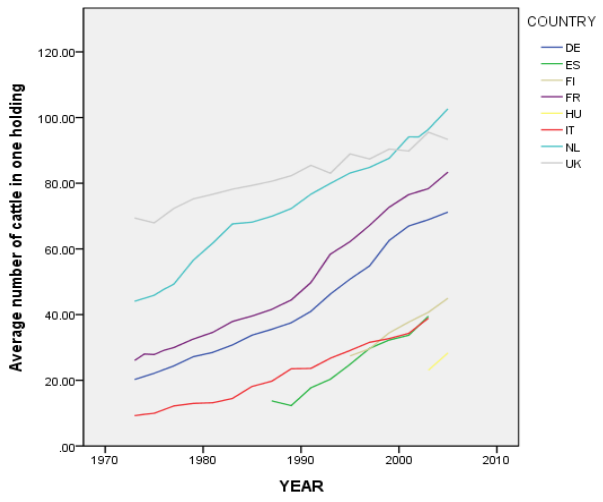
[34] In Germany, the same leading role has been taken by the government, whereas in the Netherlands, it has been the NGOs that have pushed for change towards sustainability (Oosterveer, 2012).

[35] The size of the holdings is measured in LSUs, livestock units. The Eurostat defines large holdings as having 500 LSUs or more. One broiler chicken equals 0.007 LSUs, whereas one meat cow (male, 2 years or older) is defined as 1 LSU. A 'large holding' for cattle has, therefore, at least 500 animals, and a large chicken holding has at least 70,000 animals.

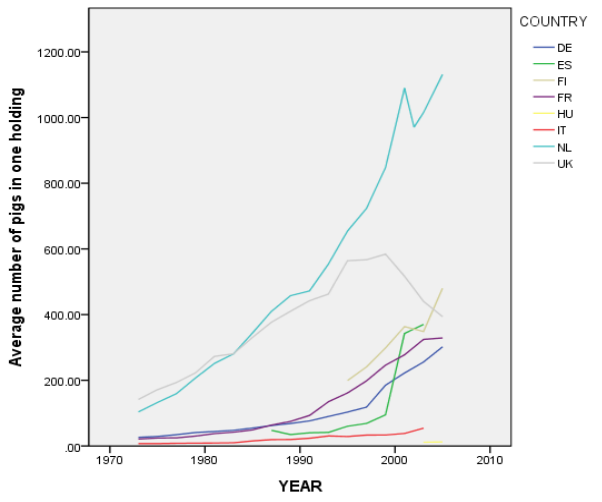
and Italy (all from 20 to 40 cows in 2005), and the largest in the Netherlands and the UK (from 90 to 100 cows in 2005),[36] whereas for pigs (Figure 13b), there is much more variation between countries. In the early 1970's the average Dutch holding had about 100 pigs, whereas in the mid 2000's it had about 1,100 pigs, experiencing a ten-fold growth. In Italy, the growth has been four-fold, from about 10 pigs to about 40 pigs, but all in all, the average Italian pig farm is very small-scale compared to the Netherlands. The United Kingdom had a very similar trend as the Netherlands up until the mid-1990's, but has since then experienced a decrease in the average pig farm size. Spain went through a rapid increase around the year 2000. The other European countries have experienced growth, but on a more modest scale, as compared to the Netherlands.

Figure 13. European trends in holding sizes for cattle and pigs.

a) Cattle



b) Pigs



Source: Eurostat.

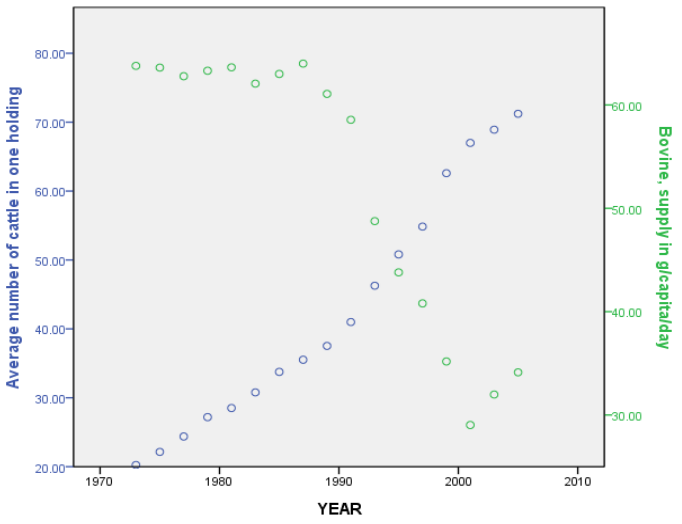
Further, it would be interesting to look at the potential impact of industrialisation on meat prices in our European data, but it is unfortunately not useful to look at correlations, or even patterns, between the growth of the animal holdings and the price of meat, due to the price data not going back far enough for this. However, we can look at the relationship between the growth of the farms and the consumption of meat, as the farm growth data mostly goes back to the early 1970's. Figure 14 shows some countries with clear patterns between these two variables.[37] To compare, in Germany beef consumption and industrialisation of beef production (as measured by the holding size growth variable) have had nearly opposite trends (i.e. negative correlation), whereas in Spain they have both grown together, i.e. correlate positively. Looking at pig meat production, in Italy the two variables are relatively closely related, whereas in the UK, the trends are opposite. Therefore, it seems that there is no universal relationship between the intensity of meat production and trends in meat consumption.

[36] As an example, in 2005, there were 37,000 holders of cattle and so, close to 4 million beef cows in the Netherlands.

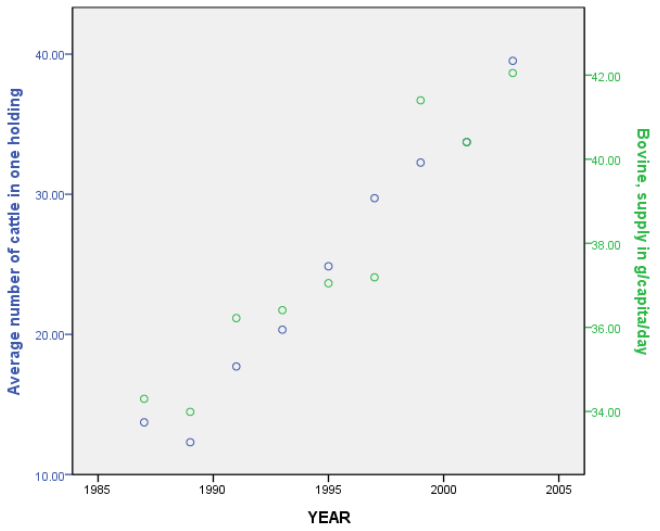
[37] Correlations between these two variables did not produce reliable results.

Figure 14. Growth of holding size vs. and meat consumption, cattle and pigs since 1973 - Some examples.

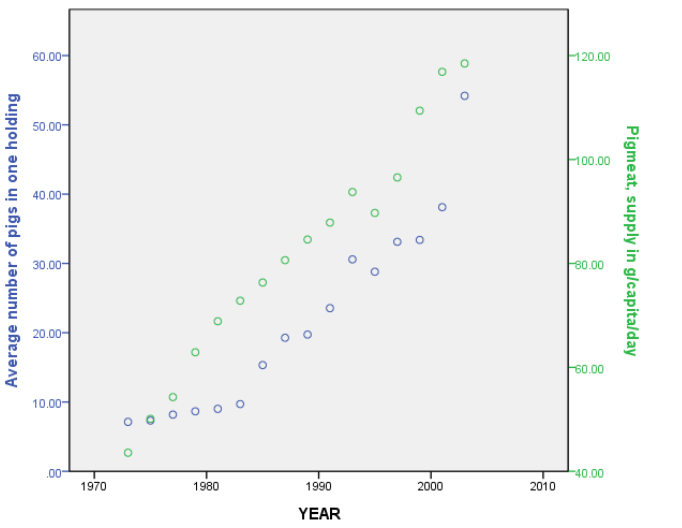
a) Germany - Average cattle holding size and beef consumption



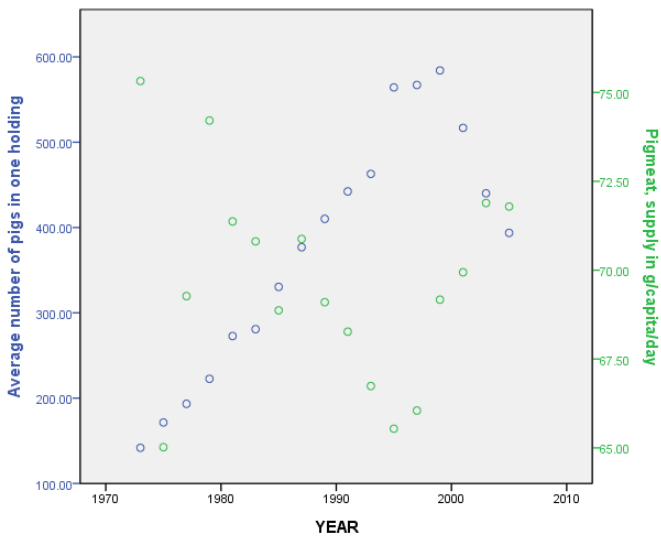
b) Spain - Average cattle holding size and beef consumption*



c) Italy - Average pig holding size and pork consumption



d) UK - Average pig holding size and pork consumption



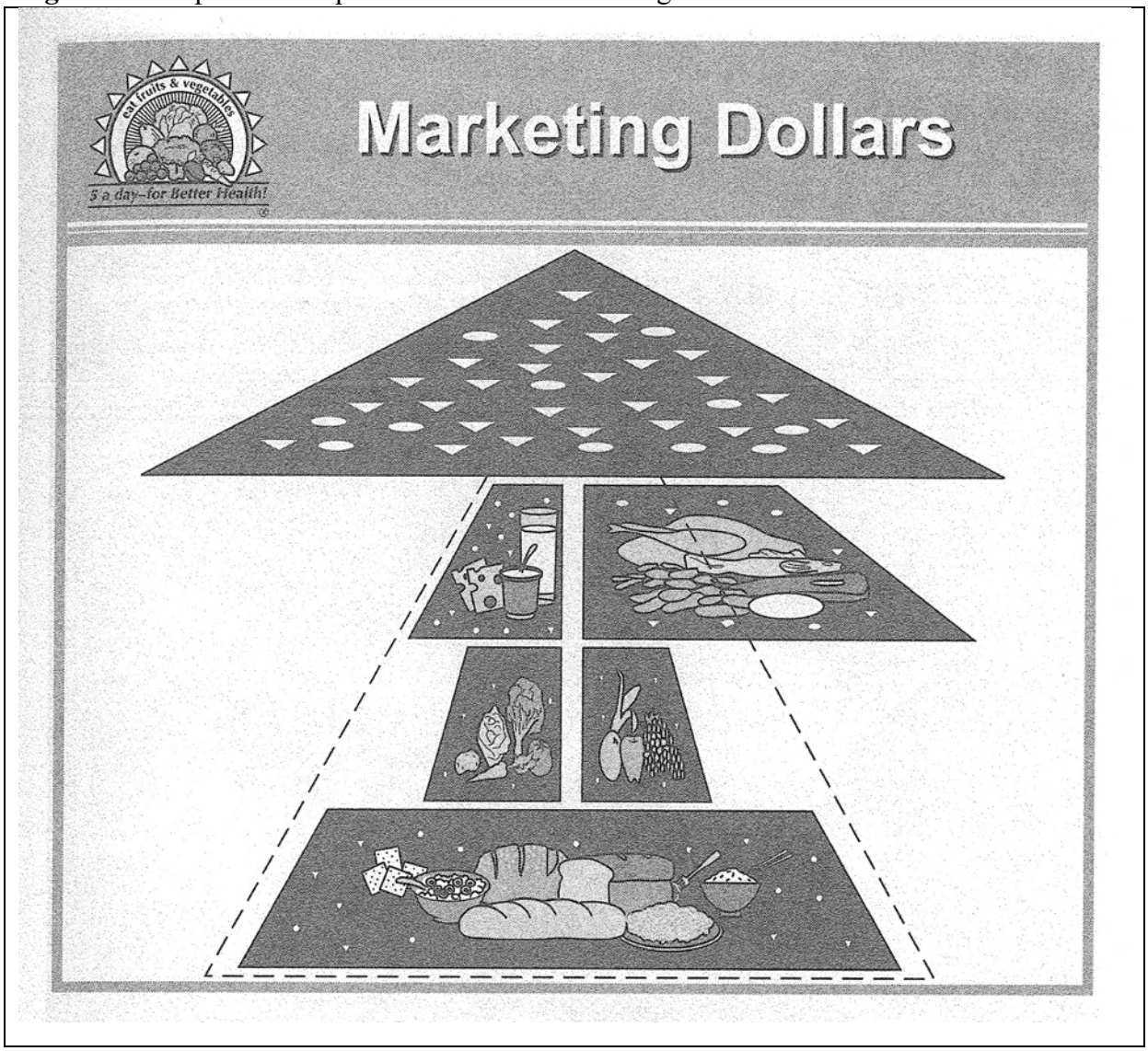
Source: Eurostat and FAO.
* For Spain, the price data only goes back to 1987.

As argued before, the meat industry has a significant impact on people's consumption behaviour. One way to examine this impact would be to look at developments in **meat industry advertisement and marketing**.[38] However, it is rather difficult to collect such data, which is generally not available from public sources, and which companies often are not obliged to disclose. Interestingly however, Nestle (2007) notes that the expenses on marketing and advertisement for any single nationally distributed food product in the US far exceed (often by 10-50 fold) the expenditure of the US government on the food pyramid, which promotes a healthy diet, with only a modest amount of meat and a generous amount of fruit and vegetables. Figure 15 shows the *proportional* expenditure on food items -

[38] Another possible way would be to look at the potential industry influence on, for example, movies. What have people been eating in the Hollywood blockbusters over time?

advertising by the industry (the rectangles) vs. governmental dietary recommendations (the dotted line). It can be seen from the figure that meat and meat products receive proportionally much more advertising expenditure in the US than they 'should', and fruit and vegetables get much too little.[39]

Figure 15. Proportional expenditure on food marketing vs. food recommendations.



Source: Elizabeth Pivonka, Produce for Better Health Foundation, in Nestle (2007: 23).

All in all, although the relevant literature mostly argues for a strong impact of industrialisation and of the industry itself on meat consumption, the relationship is complex and not easy to measure with data such as the one available for this paper.

4.5 Globalisation

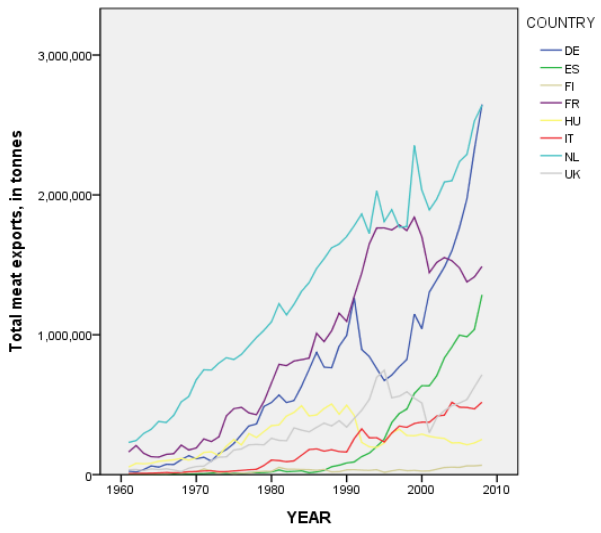
With ever increasing globalisation, both **exports** and **imports** of meat have risen steeply in the last half a century. Figure 16 shows the trends in meat exports and imports. The biggest export countries in the group of eight in 1961 were the Netherlands and France, and in 2008,

[39] The bottom of the pyramid gets the most advertising dollars, but these are most likely directed to promote more processed and, therefore, more profitable products (e.g. biscuits or breakfast cereals) belonging to this section of the food pyramid.

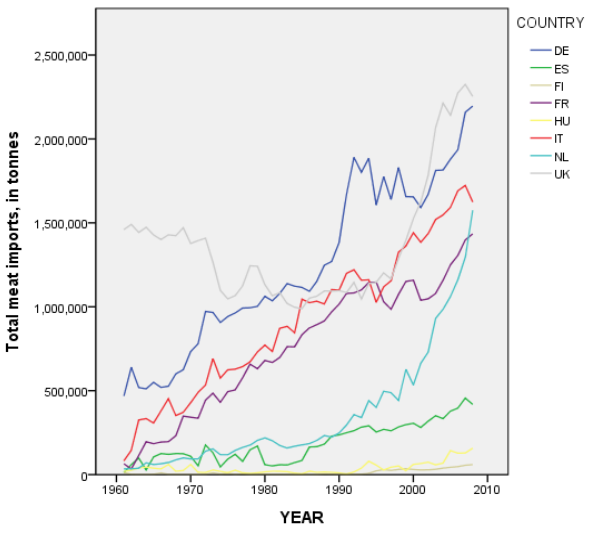
the Netherlands and Germany, with the Dutch exporting growing about tenfold over the time period (Figure 16a). France experienced a dip from the late 1990's onwards, and so did Germany around the time of the reunification in 1990, but after that the German meat export industry grew rapidly. The biggest meat importers (Figure 16b) in the group of eight countries in 1961 were the UK and Germany, and the same countries were still the biggest importers in 2008, although neither of them has had a very smooth growth line. It is notable that in many of the eight European countries, though not in all, both exports and imports have risen together in a relatively close relationship. Especially France and Italy show such development. Looking at meat exports per capita (Figure 16c), the Netherlands has been by far the biggest per capita exporter over the last half a century, and it has also experienced the steepest growth in the last two decades in the per capita imports of meat (Figure 16d). In 1961, the biggest importers were the UK and Germany, but in 2008 the UK was in second place, far behind the Netherlands. Germany was in a more average position in 2008.[40]

Figure 16. Meat exports and imports in eight EU countries.

a) Total meat exports



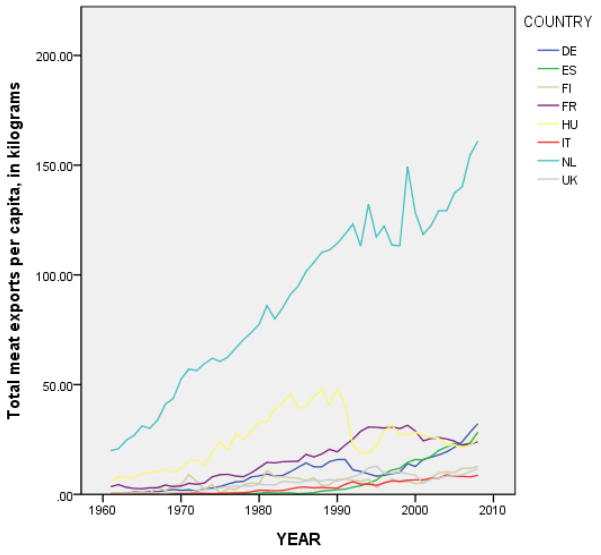
b) Total meat imports



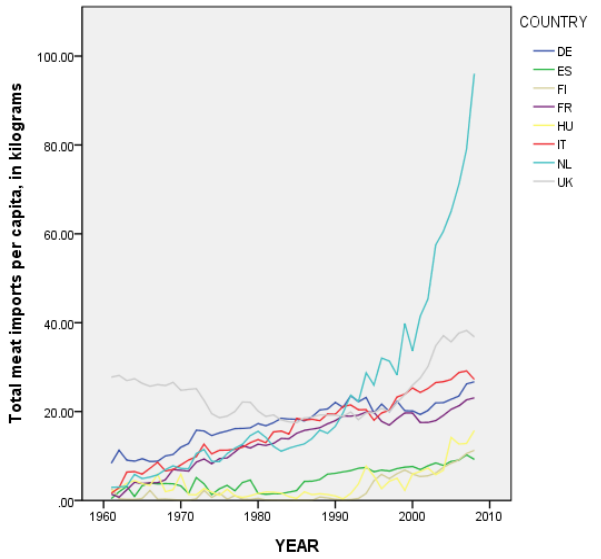
[40] Looking at individual meats and their exports and imports, there is much more variation in trends between countries. However, this detail is not shown here.

Figure 16. Meat exports and imports in eight EU countries.

c) Total meat exports per capita



d) Total meat imports per capita



Source: FAOSTAT.
Note: The share of re-exports is unknown.

But what do these trends mean for the consumption of meat? Regarding the chicken industry, Marí and Buntzel (2008) argue that international trade in chicken meat has been followed by a flow of foreign investment and a change in consumer habits. In a relatively short period of time (about half a century), the chicken has been transformed from a very 'local' chicken to a very 'global' chicken, nowadays being the most traded meat internationally. Similarly, Kasa (2008) argues that the international trade politics have facilitated a growth in beef consumption in the markets in North East Asia (Japan and South Korea), rather than the consumers simply adjusting to a larger available choice. So, there may be, at least in some cases, a causal link between increased meat trade and increased meat consumption.

Looking at our eight EU countries, there is equally good data for exports and imports as for the consumption of meat, and therefore, correlations can be calculated with some confidence. For some countries, especially Spain, but also Italy and the Netherlands, the *total* meat exports correlate positively with the total consumption of meats, both for individual meats and for total meat. With other countries, only poultry meat correlates well.[41]

Figure 17 shows some examples of the relationship between *per capita* exports and imports and the consumption of meat. Regarding meat exports, for all of the eight countries, the correlation is significant and positive for total per capita meat, and for Italy and Spain it is very high (.972 and .973, respectively), although, especially in these cases, the consumption (supply) started rising much before the exports (see Figure 17a), but the curve has been less steep than for the exports. For almost all of the eight countries (except Hungary and Italy), the correlation between per capita poultry exports and poultry consumption is very strong

[41] Looking at the meat *production* data and total meat exports, almost all of the correlations in the eight countries and in different individual meats are significant and positive, as could be expected.

(e.g. Germany in Figure 17b). With Spain, all the meats, except sheep and goat meat, correlate very strongly. Beef follows an untypical pattern here also, with positive correlation between per capita exports and consumption only for Spain and Hungary.

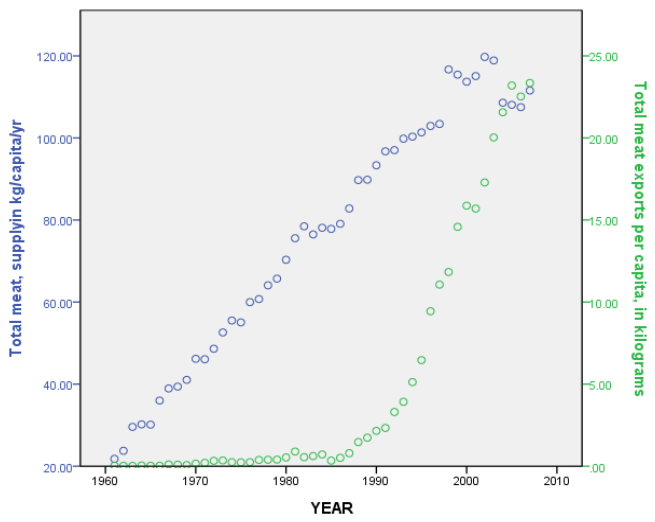
Although one might think that per capita meat consumption could correlate better with per capita imports than with per capita exports (if 'cheap imports' were increasing the supply), for the eight EU countries in question, it is actually the other way around. Imports do correlate with consumption, but the link is not as strong as with exports. There is positive correlation in total meat for four out of the eight countries, Spain, France, Netherlands, and very strongly for Italy, with one negative correlation (Hungary, possibly coinciding with the opening up of the economy). Poultry meat correlates very strongly for Spain and France, and pork for Italy (.993, Figure 17c). Beef, which generally has atypical trend lines, correlates positively for three countries on the import side: Germany, Italy and the United Kingdom (Figure 17d). With the UK, the link to the BSE crisis in the mid 1990's seems quite possible.[42] Lastly, beef correlates negatively for Finland.

The link between per capita exports and imports and per capita meat consumption is as strong as between per capita GDP and meat consumption. To note, exports and imports are part of the GDP formula, so we are actually going deeper into finding a possible causal link here.

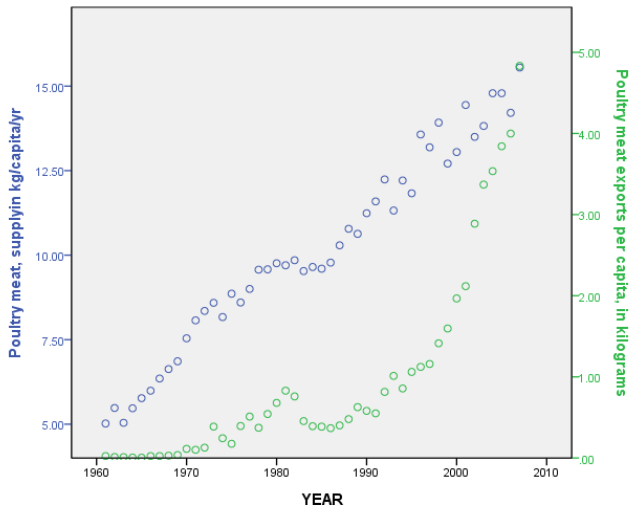
One of the possible explanations for the stronger correlation between per capita consumption and per capita exports (rather than imports) could be a kind of a scale effect: the more effectively, and therefore cheaply, meat is produced in any one country, the more it may be both consumed in and exported from that country.

Figure 17. Examples of the relationship between per capita consumption and the export and import of meat.

a) Spain - Per capita meat exports and consumption



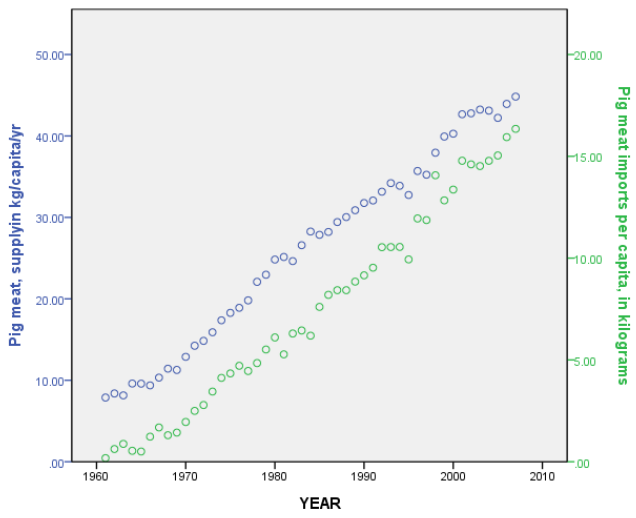
b) Germany - Per capita poultry exports and consumption



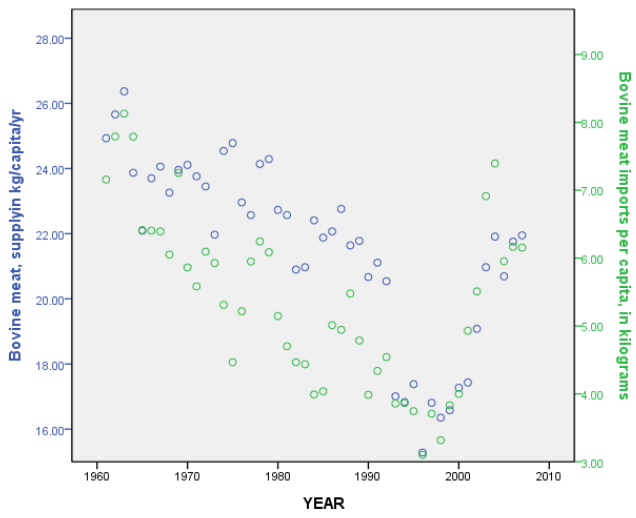
[42] There is no correlation in the UK between per capita beef consumption and per capita beef exports, which fell very sharply from mid 1990's, much sharper than consumption.

Figure 17. Examples of the relationship between per capita consumption and the export and import of meat.

c) Italy - Per capita pork imports and consumption



d) UK - Per capita beef imports and consumption



Source: Eurostat and FAO.

To conclude, our data indicates that the global meat trade, represented here by per capita exports and imports, is positively linked to the consumption of meat, especially in the case of chicken (but not beef), and the link is stronger with exports, rather than imports. This trend is also supported by literature.

4.6 Health issues

The concept of a healthy diet has gone through many transformations over time, and continues to do so. Currently, however, most experts agree that a low-meat diet is healthier than a high-meat diet which is likely to increase risks of certain illnesses, such as cancer and cardiovascular disease, as mentioned in Section 1. Accordingly, the Dutch, for example, overconsume protein by around 60%, as compared to the amount recommended by the Health Council of the Netherlands (2001). Marí and Buntzel (2008) also note that the average German eats more than twice as much meat as would be healthy. Consequently, there is a lot of room for decreasing consumption.

The official dietary guidelines in European countries, generally adopted after World War II, have been going through several periods of adjustment.[43] Currently, most EU countries recommend about 50g of *protein* daily to healthy adults (WHO, 2004).[44] Up to now, the national dietary guidelines have, however, been quite diverse, and so, the latest renewal process is intended to bring more consistency with the current science and convergence between different European countries, while also taking local culture into account (see EUFIC, 2009). Importantly, the Mediterranean diet (already the national guideline in

[43] The guidelines go through updates in all countries where they are issued, e.g. in the US they are updated every five years (see http://www.choosemyplate.gov/dietary-guidelines.html).

[44] Note that 100g of meat contains about 20g of protein. Normally, diets include many different protein sources, animal and plant based.

Greece), which encourages the consumption of red meat only occasionally, has been taken into consideration in this process.

Unfortunately, it is very difficult to examine, on a country by country basis, the impacts of information about healthy diets. However, there are some individual examples. For example, Schroeter and Foster (2004) conclude that continuous health information available to the American public on the link between cholesterol and heart disease did not decrease the overall consumption of meat over the three decades examined (from 1970 to 1999). It did, however, decrease the consumption of red meat, and increase the consumption of chicken (Regmi and Gehlhar, 2001).

In addition to government guidelines, **dietary advice for health**, **and** especially **weight loss**, can be found also elsewhere, especially in the popular media. The public tends to be persuaded simultaneously to two, sometimes opposite directions. On the one hand, people are becoming more conscious about the links between sustainability, eating habits and health, which encourages them to follow a low-meat diet. On the other hand, some of the popular weight loss diets pull people to eat a high-meat diet. In particular, the 'low carb' diet is often understood most importantly as high in meat and animal fats, rather than high in fruit and vegetables. Coinciding with the rise of such diets, also the 'lipid hypothesis' (i.e. the theory that saturated fats and blood cholesterol are major factors in cardiovascular disease) is still being questioned by some studies (e.g. Siri-Tarino, 2010).[45] In Finland, for example, it seems that a new public understanding of science (PUS) is forming: diets lower in refined carbohydrates, and higher in protein and fats, could be good for health as well as weight loss. As a consequence, meat and butter consumption in Finland keep rising, as people change their diets.[46] On the other side, Finnish health experts express their concern about the new dietary trends causing more disease in the future.[47]

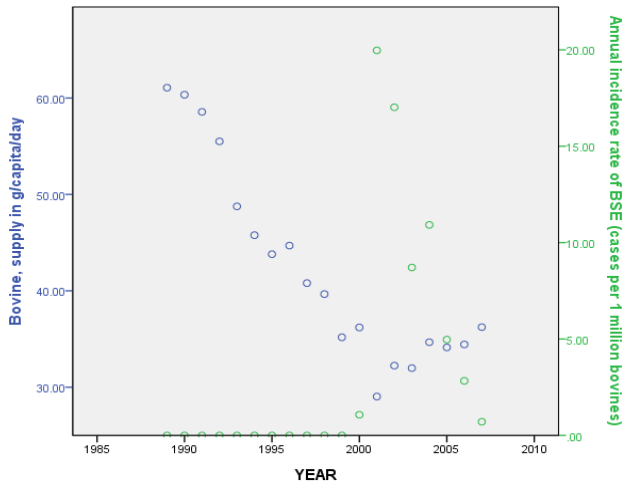
Prior to the popularity of the low-carb diet, red meat, especially beef, has experienced a clear fall in popularity in the global North in recent decades, at least partly due to its unhealthy image. This has mostly coincided with the **BSE crisis** which started in the UK in 1986.[48] Several authors (e.g. Morabia et al., 1999; Holm & Møhl, 2000; Linseisen et al., 2002) discuss the BSE impact on meat consumption vs. the general negative image for beef, and some conclude that the two issues may not be separable, as in many countries (also among the eight studied in this paper), beef consumption started decreasing well before 1996, when the BSE crisis spread outside the UK. Figure 18a shows that this is indeed the case, for example, in Germany. However, the impact of UK crisis may have been felt elsewhere in Europe already from the start of the crisis in the mid 1980's, as the situation was discussed in the media, for example, from the very beginning. Figure 18b shows the relationship between the

[45] The Siri-Tarino study was financed by US National Institutes of Health, but also by Unilever and the US National Dairy Council (dairy farmer association), so its results could be biased.
[46] Article in the Helsingin Sanomat on 22 January 2012.
[47] The cholesterol levels of the Finns have had a sudden turn for the worse in early 2012, most likely as a consequence of the low-carb diet trend (which includes eating lots of saturated fats) of last years (article in the Helsingin Sanomat on 1 September 2012).
[48] The BSE crisis started with the first case of a cow infected with bovine spongiform encephalopathy found in the UK, and spread to Europe and elsewhere from 1996 onwards. The export ban on British beef was established in 1996.

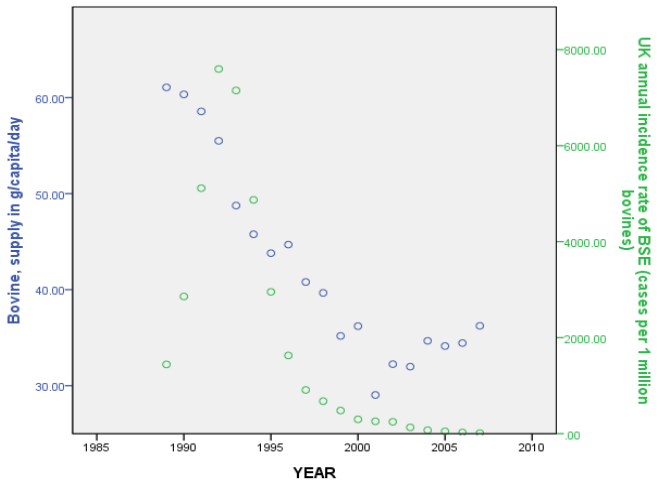
UK (internal) crisis and German beef consumption, and here the correlation is actually positive and quite strong (.796). In the UK itself, consumption also came down, but recovered, once the BSE cases went down (Figure 18c). This recovery did not take place in Germany, nor in most of the eight EU countries studied in this paper. Exceptions to decreasing trends include Spain, where beef consumption kept on rising throughout the 1990's and early 2000's despite the BSE crisis (Figure 18d), and France where the correlation is positive, but weak.[49]

Figure 18. Examples of the relationship between BSE crisis and the per capita consumption of beef in various EU countries.

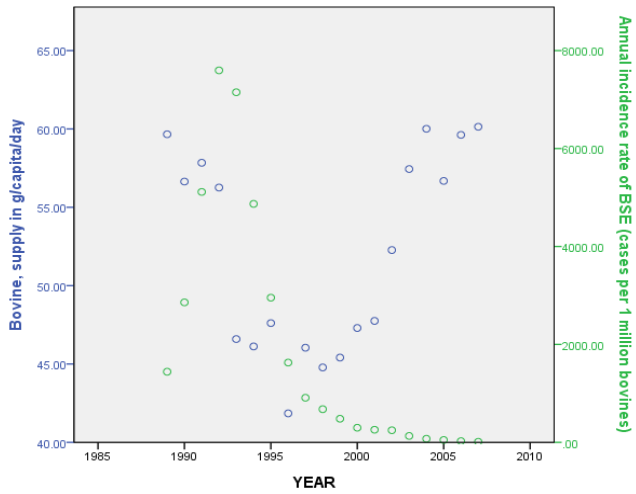
a) Annual incidence of BSE and beef consumption in Germany



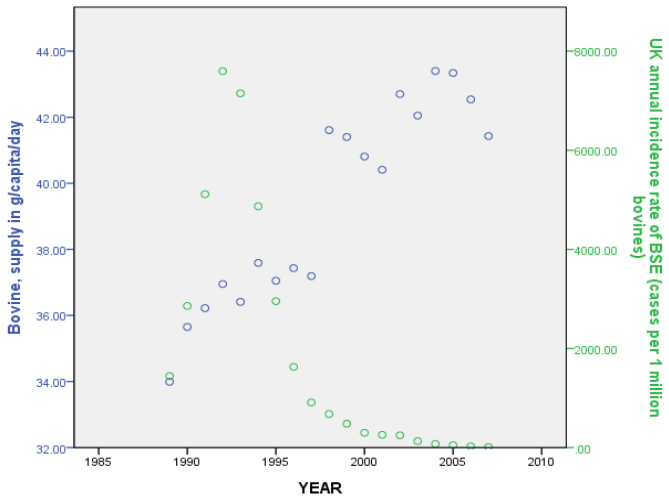
b) Annual *UK* incidence of BSE and beef consumption in Germany



c) Annual UK incidence of BSE and beef consumption in the UK



d) Annual UK incidence of BSE and beef consumption in Spain



Source: FAO and OIE (World Organisation for Animal Health).

[49] Interestingly, the avian flu that hit the Netherlands in 2003 did not further decrease the already declining Dutch consumption of poultry, as one might expect. Quite the opposite, this trend was reversed right after the crisis, with a peek in the Dutch poultry consumption.

Table 1 shows the incidence of BSE in the eight countries studied here. A quick scan of major daily newspapers[50] in these countries shows that, in all of them, the developments related to the crisis have been mentioned in hundreds of articles, regardless of the national BSE incidence rates, which have been very low in most of the countries, apart from the crisis center (UK). Therefore, if the *UK crisis* decreased beef consumption in those European countries where the two variables correlate positively, it seems that other factors must have been more influential in the countries (Spain, France) where there is no positive correlation, or it is weak.[51]

Table 1. Incidence of BSE in eight EU countries by 2008.

Country	**Number of BSE cases until 2008**	**BSE cases/10,000 population**
Germany	415	0.051
Spain	721	0.180
Finland	1	0.002
France	992	0.164
Italy	141	0.025
Hungary	1	0.001
Netherlands	84	0.053
United Kingdom	184,561	31.396
EU-27 average incidence without the UK		0.325

Source: BSEinfo.org and Eurostat.

On the other hand, Anderson and Shugan (1991) observed twenty years ago that the perceived (but not actual) high convenience, rather than healthiness of chicken was the main contributor for the shift from chicken to beef at that point in the United States. It must be concluded again, that making universal connections between single influences on meat consumption is very challenging. However, issues to do with health are still likely to affect meat consumption in some contexts, in particular, there would appear to be a link between the image of beef (whether from the BSE crisis or from elsewhere) and the consumption of beef, and this is also supported by our data for several countries.

As regards the link between cultural issues and health, over the last decades in Northern Europe (and in the UK and in the US) people have been increasingly concerned with issues of health, as regards diets, whereas Southern Europe is more concerned with maintaining their own cultural traditions, such as the Mediterranean diet (Fischler, 1999, in de Boer et al., 2006). De Boer et al. (2006) suggests that combining these two worries into trying to get all Europeans to eat more in line with the Mediterranean diet, healthy and low in meat, would mean moving towards a sustainable (and healthier) diet.

[50] The newspaper archives checked were El Pais (Spain), Helsingin Sanomat (Finland), Le Monde (France), Die Welt (Germany), La Repubblica (Italy), Volkskrant (Netherlands) and Népszabadság (Hungary). In all these newspapers, the archives are searchable from at least 1995, but in many cases already from the 1980's.

[51] In the UK, as mentioned earlier, beef consumption also came down at the beginning of the crisis, but recovered once the BSE cases went down.

4.7 Other potentially relevant issues

The discussion and analysis in Section 4 is by no means meant to be inclusive of all possible influences on meat consumption in Europe or elsewhere. However, to conclude, we mention two more groups of factors with known or potential influence on meat consumption.

Firstly, *political factors* can have influence. For European countries, the **EU (agricultural) policies** have had an effect. Westhoek et al. (2011) note, for example, that over the past decades, even if probably decreasingly, the Common Agricultural Policy (CAP) has increased meat production and lowered prices, therefore also impacting on consumption. It was also investigated briefly for this current paper, whether the joining of the Union would seem to have affected the levels of meat consumption in various EU countries, i.e. through the effect of EU policies on a new Member State. However, no such influence could be observed at first hand.

It is also partly a political matter how self-sufficient various countries aspire to be in meat production, and perhaps this could also have an impact on the consumption of meat, positive or negative. Unfortunately, the data on the **degree of self-sufficiency** of EU countries extends back to only 1991, so there is not enough data for proper investigation. The available data shows both some relatively strong positive and negative correlations, varying between countries and different meats without any clear patterns. There are two countries, Spain and the Netherlands, however, where the total consumption of meat correlates positively with the degree of self-sufficiency.

Secondly, there are fairly clear indications that certain *demographic factors* can have an influence on meat consumption. For example, Regmi and Gehlhar (2001) conclude that older people in the US eat less meat as compared to younger people. However, the European eight-country data for this paper shows no evidence of such impact from age, and in fact, generally speaking, the more there are **people 65 years and older** in the population in these European countries, the more meat is consumed. It could perhaps be that older Europeans are generally more conservative in their eating habits than younger Europeans. However, age correlates negatively with beef consumption for seven out of the eight countries, with the exception of Spain, so more in line with the US findings. Similarly, Regmi and Gehlhar (2001) conclude that higher levels of education lower meat consumption in the US. Again, this effect is not clearly observable in the European data, as only for Hungary does the total meat consumption correlate negatively with the **share of university students** in the population. However, there is some indication that the US observation could be true again as regards beef consumption in Europe, as only for Spain, does beef consumption correlate positively with the share of university students, and it correlates negatively for Finland, France, Hungary and the UK. So, for both older age and higher education, the European data indicates that they increase somewhat people's willingness to avoid beef, possibly for its unhealthy image.

Further, gender seems to also have an influence on meat consumption, whereby **women** tend to avoid consuming red meats more than men, and opt instead for white meat, mainly chicken (see e.g. Kubberod et al., 2002). Also, Lea and Worsley (2001) found clear gender (and age) differences in terms of influences on meat consumption. The EU data is not investigated for the gender factor in this paper, as there is no suitable quantitative data available.

Also part of demographics, the level of **unemployment** could have some impact on meat consumption. On the one hand, the unemployed would tend to have less money to buy food, and this might affect either their total consumption of meat, or their choices between different meats. On the other hand, unemployment might have some other consequences, e.g. it could increase the consumption of fast food, which often contains beef. Looking at the European data for this paper, for some countries there is, indeed, positive correlation between poultry consumption and the level of unemployment over time (Germany, Finland and France), and negative correlation between beef consumption and unemployment (Germany, Finland), i.e. people in hardship may shift from more expensive meats to less expensive meats, as could be expected. However, there are other patterns too: the Spanish eat more sheep and goat meat when unemployed, the Hungarians eat less poultry (strong correlation!), and the Italians eat more all kinds of meat, especially when men are unemployed, as opposed to women. For the Dutch and the British the correlations between unemployment rate and meat consumption are very weak.

A related factor is **women's labour force participation.** It could be concluded from the US study by Schroeter and Foster (2004) that the more women are working, the less time and energy they have to influence their own and their families' food choices, so perhaps more meat is eaten when the share of economically active women is larger.[52] This data is available from the ILO only sporadically for the eight EU countries until the late 1970's, and from there on more regularly, but overall coverage not very good. Correlations with the consumption data for the eight EU countries have therefore not been performed in this paper.

To conclude again from the discussion in Section 4, it seems that there are generally many factors at work influencing meat consumption, and different geographical or cultural contexts play a part in the combinations of factors and their impacts. The next section will make some further conclusions and suggest a possible way forward in studying meat consumption.

[52] On the other hand, similar to what happens with urbanisation (see Section 4.2), the convenience factor should play a role here too.

5. Conclusions and further considerations

5.1 The secondary quantitative data

In conclusion, the per capita consumption trends vary significantly between the eight European countries selected for a closer look in this paper. Table 2 summarises some of the developments. Regarding the total per capita consumption of meat over the last half a century, the United Kingdom is the country with the most stable consumption (but with a rise lately), Spain with the fastest increase (from the lowest to the highest position), and the Netherlands with the steepest decrease, in addition to Hungary. Other countries with a clear decrease at some point include France, where consumption was levelling off in the 1980's, and falling in the 2000's, and Germany, where consumption was falling in the early 1990's, and then levelling off lately. The lowest level of consumption at the moment in this group can be found in Finland and in the Netherlands, but in Finland meat consumption is currently rising, and in the Netherlands it is falling.

When looking at specific meats, the most remarkable developments in the last half a century are that per capita beef consumption has remained more or less constant when averaged over the eight countries, while chicken consumption has nearly tripled, and pig meat consumption risen 80%. Looking at the country level, the consumption of beef has either decreased or stabilised, except in the UK and in Spain, and nearly all countries (except Italy and France) have increased their per capita consumption of chicken. Indeed, one overall trend over several decades has been a gradual shift from beef to chicken. Regarding pig meat, the patterns vary more (see Table 2), and lastly, the consumption of sheep meat has remained stable in all the countries, except in the UK, where it has decreased over time.

Why the differences? For example, why has Spain gone through the transformation from the lowest (60g per capita supply[53] in 1961) to the highest (328g per capita supply in 2002) meat consumer country? Why has the UK consumption been so stable? Why did consumption decrease so steeply in the Netherlands? From the point of view of sustainability research, what makes people reduce, or not reduce, meat consumption, or change from one meat to another, with somewhat different environmental, and human and animal welfare impacts?[54]

Regarding potential influences on meat consumption, Table 2 also shows some of the findings from the secondary data together with some conclusions from relevant literature. It can be seen from this table that some trends are in line with what could be expected (see below), but others are not, and in some cases the 'relationships' found, i.e. positive or negative correlations, might be coincidental more than causal.

The overall impression from the secondary data analysed in this paper and from the relevant literature found on the levels of meat consumption over time is that, on the one hand, both macro-level trends and micro-level factors have an impact.

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[53] These numbers refer to the FAO meat supply data, taken to represent meat consumption as regards trends and differences between EU member states. The actual average consumed amount of meat is somewhere around two thirds of these figures. See Section 2 for details.

[54] From climate change point of view, switching from beef to chicken makes a big difference. For example, the GHG emissions from producing 1 kg of beef can be more than 10 times as much as for 1 kg of chicken.

At the macro level, it seems that increased living standards, industrialization of meat production, increased trade and industry influence, urbanisation (with its related convenience factor), globalization of 'Western' food culture, all have the potential to significantly increase meat consumption. Health scares (such as the BSE crisis), the more general unhealthy image of beef, and concern stemming from factory farming, run counter to the macro level trends, with some potential to reduce meat consumption, or to reduce the environmental impact of meat consumption, e.g. with a switch from beef to chicken, or from industrial to organic meat.

At the micro level, political factors, such as agricultural policies, and demographic factors, such as age, gender, education or employment status can all further influence (up or down) the level of meat consumption, or choices between different meats.

On the other hand, although most of these macro and micro factors are, and have been, quite similar between different European countries, significant differences still exist. This could be due to the particular, unique combinations of the aforementioned factors in each country, or it could be due more to historical, social and cultural factors and differences between the countries.

According to York and Gossard (2004), and looking at global scale data on meat consumption, **culture** or **geographical region** affects meat consumption. For example, the global North and the Middle East tend to eat more meat the wealthier the nations become, whereas at least in some parts of Asia this effect is significantly less, and instead, there people tend to shift towards eating more fish when they become wealthier. Further, it must be noted that culture is linked to other variables related to increased meat consumption: urbanisation generally increases exposure to Western food habits,[55] and the ecological context of a country can be reflected in the cultural food preferences of that country. All in all, York and Gossard (2004) emphasize the importance of looking at cultural factors. However, the differences between, especially Western European countries are more subtle than between e.g. Europe and Asia, and so, quantitative data is of less help in determining cultural differences in eating habits.

The conclusion from analysing the secondary quantitative data is therefore, that, although looking this data is somewhat helpful, no clear one-on-one causal relationships can be drawn between potential influences measured with this available quantitative data and changes in meat consumption. Therefore, to investigate further the question of what might influence the consumption of meat, some qualitative analysis might be useful, and this will be discussed later in this section.[56] In particular, analysing country specific discourses about the problems around meat production and consumption will be suggested. First however, the next sub-section revisits the problems themselves, seen as risks.

[55] However, Marí and Buntzel (2008) note that the Westernisation (or internationalisation) of food habits has also been gradually spreading from urban areas to the countryside.

[56] It may be possible subsequently to compare part of the secondary data on consumption trends to the primary data to see whether there are links between the two.

Table 2. Meat consumption trends and relationships to potential influences.

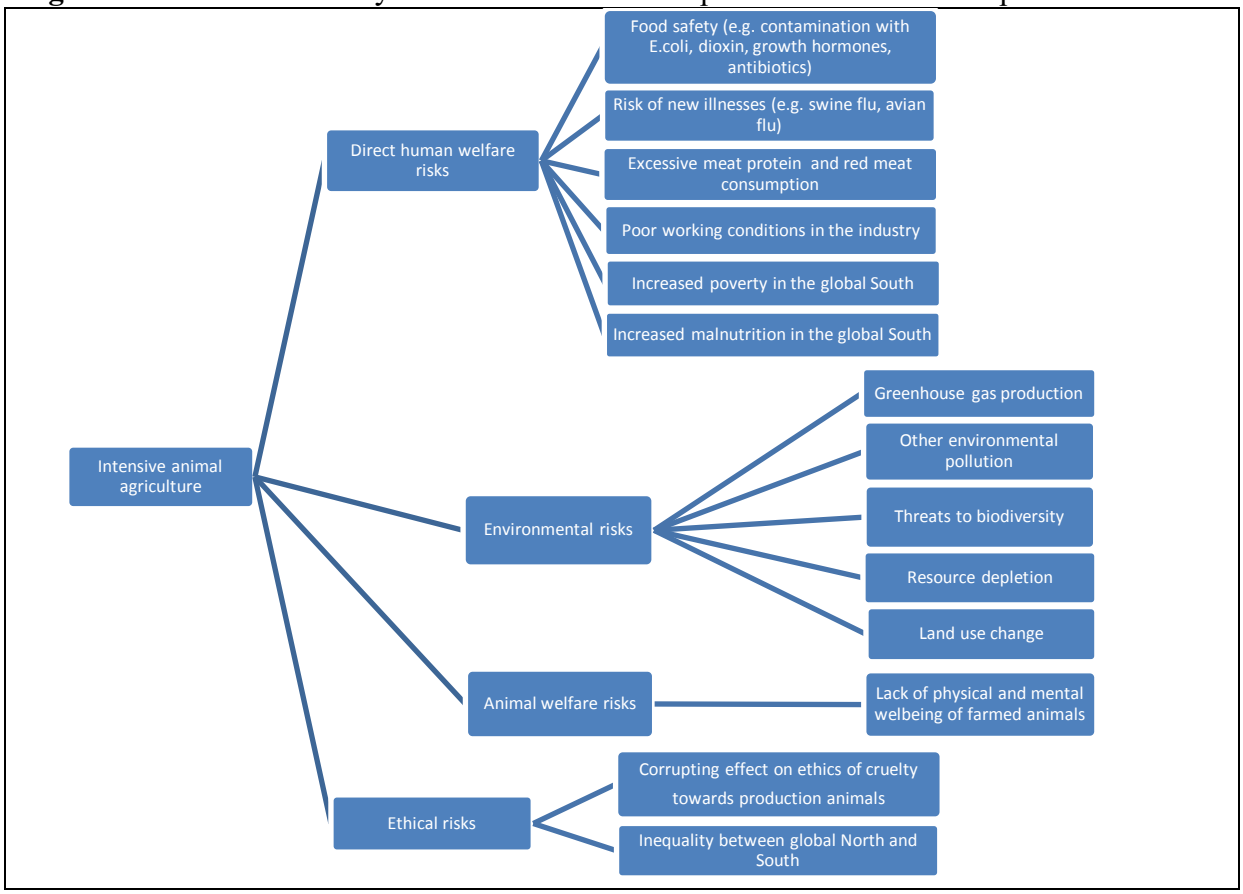
Location of findings	**Basic trend between 1961 and 2007**	**Positive relationship (i.e. these factors may increase meat consumption)**	**Negative relationship (i.e. these factors may decrease meat consumption)**
Literature		Standard of living; urbanisation; industrialisation; globalisation; EU agricultural policies until recently; increased health information (and poultry); female gender (and poultry)	Higher cost of meat; increased health information (and beef); BSE crisis; older age (and beef); higher education; female gender (and beef)
Germany	Total meat: clear fall in the early 1990's, levelling off lately; overall levelling off or decrease for beef; overall increase for chicken; increase in pork until about 1990, then a decrease, but high consumption overall; stable, but very low consumption of sheep meat	Urbanisation (and poultry); globalisation (per capita exports, and total meat and poultry; per capita imports and beef); unemployment (and poultry); older age (and total meat)	Industrialisation (holding size growth and beef); UK BSE crisis (and beef); older age (and beef); unemployment (and beef)
Spain	Total meat: fastest increase (from lowest to highest position, but levelling off lately); overall increase for chicken; continuous increase for pork, except a recent dip in the 2000's; still rising consumption of beef; slightly rising, but still low consumption of sheep meat	Urbanisation (and total meat, poultry and beef); industrialisation (holding size growth and beef); globalisation (per capita exports and total meat, poultry, pork and beef; per capita imports and total meat and poultry); degree of self-sufficiency (and total meat); older age (and total meat); higher education (share of university students and beef); unemployment (and sheep)	Higher costs (working time required to buy poultry)
Finland	Total meat: lowest consumption at the moment in the group together with the Netherlands (but rising); overall levelling off or decrease for beef; overall increase for chicken; increase for pork until about 1990 then flattening; stable, but very low consumption of sheep meat	Standard of living (per capita GDP, and total meat and poultry); urbanisation (and pork); higher costs (prices and beef); globalisation (per capita exports, and total meat and poultry); older age (and total meat); unemployment (and poultry)	Higher costs (prices and poultry, working time required to buy poultry); globalisation (per capita imports and beef); UK BSE crisis (and beef); older age (and beef); higher education (share of university students and beef); unemployment (and beef)

France	Total meat: levelling off 1980's, falling in the 2000's; overall levelling off or decrease for beef; increase in pork until about 1980 then flat consumption from there on; slightly rising, but still low consumption of sheep meat	Urbanisation (and poultry); globalisation (per capita exports, and total meat and poultry; per capita imports, and total meat and poultry); older age (and total meat); unemployment (and poultry)	Older age (and beef); higher education (share of university students and beef)
Italy	Total meat: overall levelling off or decrease for beef; continuous rise for pork; stable, but very low consumption of sheep meat	Standard of living (per capita GDP, and total meat and pork); urbanisation (and total meat, beef and poultry); industrialisation (holding size growth and pork); globalisation (per capita exports and total meat; per capita imports, and total meat, pork, beef); older age (and total meat); male unemployment (and total meat)	UK BSE crises (and beef); older age (and beef)
Hungary	The steepest decrease, together with the Netherlands; overall levelling off or decrease for beef; overall increase for chicken; increase in pork until about 1990, but highest overall consumption until mid 1990's, then a deep decrease until now; stable, but very low consumption of sheep meat	Urbanisation (and poultry); higher costs (prices and beef); globalisation (per capita exports, and total meat, beef); older age (and total meat)	Urbanisation (and beef and sheep); higher costs (price of poultry); globalisation (per capita imports and total meat); UK BSE crisis (and beef); older age (and beef); higher education (share of university students, and total meat and beef); unemployment (and poultry)
Netherlands	The steepest decrease, together with Hungary, lowest consumption at the moment in the group together with Finland (but falling); overall levelling off or decrease for beef; overall increase for chicken; increase for pork until about 1990, decrease from 2000; stable, but very low consumption of sheep meat	Urbanisation (and poultry); globalisation (per capita exports, and total meat and poultry; per capita imports and total meat); degree of self-sufficiency (and total meat); older age (total meat)	UK BSE crisis (and beef); older age (and beef)
United Kingdom	Most stable total consumption (but a rise lately); overall increase for chicken; flat and relatively low consumption of pork throughout; still rising consumption of beef; decrease in consumption of sheep meat which was relatively popular before	Urbanisation (and poultry); higher costs (working time required to buy pork and sheep); globalisation (per capita exports, and total meat and poultry; per capita imports and beef); older age (and total meat)	Urbanisation (and sheep); higher costs (working time required to buy poultry); industrialisation (holding size growth and pork); UK BSE crisis (and beef); older age (and beef); higher education (share of university students and beef)

5.2 Risk frame of meat and consumer behaviour

Risk frames consider issues in terms of their associated risks (or problems). Seen in a technological risk frame, intensive animal agriculture has generated new risks in both the production and consumption of meat, as explored in Section 1. These risks can be divided to four main categories: direct human welfare risks, environmental risks, animal welfare risks and ethical risks (see Figure 19).

Figure 19. Risk frame for systems of intensive meat production and consumption.



A risk frame can be useful as a reflection of the complex reality of a problem such as the system of provision for meat, and it is also suggested here as one tool for studying meat discourses. Discourses often take place around problems (rather than around everything being fine, i.e. the lack of problems), or risks of something undesirable happening. For example, the risk of dangerous climate change or resource depletion, both augmented by an unsustainable meat consumption pattern, are topics discussed in the media. Indeed, as e.g. Van Wassenhove et al. (2012) note, the media plays a decisive role in what is perceived as a risk by the public. As risks are constructed by individuals or groups of people (or organisations, such as NGOs, governments, firms or the media) contemplating the likelihood and severity of the consequences of an event, there is no *perceived* risk vs. *real* risk as such. Risks can be, however, constructed differently. For example, a comparative study by Bauer et al. (2006) on BSE showed how differently people in Germany, Finland, Italy and the UK perceived risks due to the influence of national media.

Further to the media influence, the familiarity or distance of an issue can play a role in risk perception. For example, Rip and Talma (1998) argue that everyday technologies are generally seen as less threatening, whereas more distant technologies can seem more threatening. Intensive agriculture manages simultaneously to be related to an everyday practice of food consumption, and a more distant technology, as most people are not involved in using the technology, and are fairly unfamiliar with the precise details of it.

Drawing further from the risk perception literature (e.g. Slovic, 1987, 2000; Etkin and Ho, 2007), different influences on individual risk perception include other perceived characteristics of the risk,[57] uncertainties, perceived benefits, ideology and environmental and social values of individuals. For example, perceived benefits and perceived risks seem to have an inverse relationship (Fischoff et al, 1978; Lorenzoni and Pidgeon, 2006). Meat production involves a more distant technology with more perceived risks and fewer benefits, while meat consumption as a familiar everyday practice has fewer perceived risks, and more benefits. Since the production and consumption of meat have been so disconnected in the recent past (e.g. Hoogland et al., 2005), the gap between knowing about the risks related to unsustainable meat, and action in accordance with that knowledge (the *knowledge-action gap*) may be more challenging to overcome than with other areas of concern for sustainability, such as mobility or energy.[58] Hoogland et al. (2005) further argue that to reduce the cognitive dissonance that is created by the knowledge-action gap or the *value-action gap* (difference between values held by an individual and action keeping with those values), people tend to ignore the origin of meat. In other words, they do not think about, for example, the suffering of the animal that the meat comes from, and in fact, they often do not think that the supermarket package containing meat comes from an animal at all.[59] Mayfield et al. (2007) come to similar conclusions in their study of consumers in the UK, Italy and Sweden, and Lea and Worsley (2001) conclude from their study in Australia that personal values have little impact on meat consumption. However, de Bakker and Dagevos (2011) hold a more positive view, whereby they believe that many consumers are susceptible to change their meat consumption behaviours, for example, as they may be already committed to at least one weekly meat-free day, and therefore, they may not find it excessively challenging to cross the gap (which these authors call the *citizen-consumer gap*).[60] Further, Holm & Møhl (2000) suggest based on their study in Denmark, that the gap may be crossed by some (especially female) consumers by re-structuring meals away from meat occupying a central role, rather than by intentional decreased meat consumption.[61] Belz and Peattie (2009), among others, emphasize the importance of linking up personal benefits (or core benefits) with socio-

[57] Determining the characteristics of a risk include considering whether it is involuntary, dreaded, delayed in impact, uncontrollable, new or catastrophic, or the opposite of any of these characteristics.

[58] Unsustainable consumption in general has relatively clear perceived (at least) near term personal benefits from maintaining *status quo*.

[59] As a way forward, Hoogland et al. (2005) suggest that greatly increased transparency in the meat chain (from farm to processing to supermarket) could be useful in getting people to act, i.e. to eat less meat and/or buy more organically or ethically produced meat.

[60] De Bakker and Dagevos (2011) suggest three different routes for different categories of consumers with relevant potential for change: 'passive partners', 'discussion partners' and 'citizen-consumers'.

[61] De Boer et al. (2009) also point out that concerned consumers are generally divided into two groups, those whose motivation is to look for the best alternative (e.g. buying free-range meat), and those whose motivation is to avoid the unacceptable alternatives (e.g. not buying intensively produced meat).

ecological benefits ('Motivallianzen'), so that for example, buying free-range meat can be healthier, tastier and safer than conventional meat, in addition to being better for the society or the environment.[62]

Regarding changing lifestyles in the context of climate change, Weber (2006) points out that it matters for risk perception whether people are *concerned* about an issue on a conscious level, or *worried* on an emotional level, as without worry, people in general tend not to take action or make significant changes in their lives. On the other hand, if a risk seems too threatening, people may deny its existence altogether, e.g. in connection with climate change, this causes scepticism as to the existence of the problem (e.g. Van Der Linden, 2012; Whitmarsh et al., 2012). Norgaard et al. (2012) argue further that the disjuncture between our current western lifestyles and the changes necessitated by climate change are felt as a threat at three levels, individual (identity threat), institutional (challenge to social cohesion) and societal (legitimation threat). The cultural inertia operating at these three levels is therefore a very powerful force.

The literature on societal transition towards sustainable consumption is rather large, also regarding behavioural change, or sustainable food consumption, and it is not the purpose to discuss it further in this paper. We will now turn to look more at the topic of the controversiality of meat.

5.3 Debating and framing meat

Fiddes (1991) notes that meat eating can be considered as ideological or political an issue as vegetarianism, as it involves an abundance of social rules and meaning. He then argues that, consequently, the habit of meat eating requires a justification just like vegetarianism, and it cannot therefore just be passed as something obvious. Until the 17th century, eating meat used to be considered luxury for most people, rather than everyday practice. However, cultural differences have had a role in eating, or not eating, meat for millennia, so that for example in Europe, the Northern (Germanic and Celtic) cultures were consuming more meat than the Southern (Roman and Greek) cultures, dominated by agriculture (de Boer et al., 2006).[63] York and Gossard (2004) emphasize also the impact of the ecological context (climate, resource availability), and it's link to culture that has developed over time within that context.

The advance of science from the 17th century onwards strengthened the belief that humans must dominate nature, and the average meat consumption started to rise. Associated with this were frequent claims from the scientific community saying that meat was a source of 'strength and vigour' more than any other food. With the advances in refrigeration and transport technology in the 19th century, meat consumption rose further (Fiddes, 1991). Also economic factors, such as increases in the equality of national incomes, food trade, and internationalisation of eating habits, have further evened out differences in meat consumption, although many cultural differences still remain (e.g. de Boer et al., 2006). Section 4 of this paper investigated some of these influences.

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[62] Belz and Peattie (2009) argue that these motive alliances can be made acceptable to, or even favoured by consumers, by using social marketing.

[63] Further, in medieval Germany, for example, meat consumption was actually very high for a considerable period of time, as ordinary citizens often got their pay in meat instead of money (Bork, 2006).

When questioned, meat eaters have generally justified their diet for religious or health reasons, and also as something natural, traditional or necessary for humans, and these lines of thought go back a very long time. Joy (2010) talks about the three Ns of justification regarding meat consumption: normal, natural and necessary. People have internalised these so well that they are usually considered truths rather than opinions, and therefore, any moral considerations can be put aside. Joy uses the term 'carnism' to indicate the culture, or the invisible belief system of meat eating. Meat eating has traditionally also been viewed as something masculine (e.g. Ruby and Heine, 2011). There are, however, some signs that the image of meat is changing (e.g. Ruby, 2012, scanning much of the related literature; De Bakker and Dagevos, 2011, conducting a study on the Dutch consumers).[64] As mentioned previously, there is a trend among some consumers to view meat, or at least beef, more negatively than before, in relation to its healthiness or the impacts of meat production.

For millennia, vegetarians have similarly had a variety of reasons not to eat meat by choice, earlier more for philosophical, ethical or religious reasons, and since the late 18th century also for health or environmental reasons (Twigg, 1983, in Fiddes, 1991; Ruby, 2012).[65] Although it is possible to categorize modern vegetarians into either mainly ethical vegetarians or mainly health vegetarians (Ruby, 2012), they are likely to increasingly make their dietary choices considering the entire variety of problems related to meat production and consumption, discussed in the previous section, and importantly also considering the environmental issues (Spaargaren et al., 2012).[66] Increasingly also, these problems are in the minds of the general public. These public and media discussions have varied from country to country over the last decades, often generated by a regional health scare, such as the European BSE crisis in the 1990's, avian influenza epidemic taking place mostly in Asia from the early 2000's onwards, or more local crises of meat contamination with dioxin or other toxins. Other more global (or at least global North) and even historical reasons for waves of public discussion have included the immoral treatment of animals,[67] the perceived unhealthiness of red meat, or more lately, the contribution of meat production to climate change. Often, a present day discussion may start with a health scare, but then leads to a wider debate on the pros and cons of meat production and consumption. Such debate, however, has not lead to a permanent increase in the numbers of vegetarians, which in Europe ranges in recent years from around 1% to between 5-10%, also depending on the definition. Temporarily, these numbers can change, e.g. in France the share of vegetarians rose to 6% around 2001, most likely as a consequence

[64] De Bakker and Dagevos (2011) also find in their study that 70% of the Dutch consumers could in fact be part-time vegetarians (or 'flexitarians'), having at least one meat-free day in a week, and placed between meat lovers and full-time vegetarians. They emphasize that this group should be paid more attention to, as it may be relatively easy to make them reduce their meat consumption further. Further, Schösler et al. (2012) come up with four different policy-relevant pathways which could be directed in particular towards this majority of (Dutch) consumers.

[65] However, early examples of ethical vegetarians include Leonardo da Vinci (McCurdy, 1932, in Fiddes, 1991), and currently up to 40% of Indians are vegetarians, often for religious reasons (The Hindu, Aug 14, 2006). Research on vegetarians is, however, heavily biased towards the global North.

[66] Vinnari (2010) argues that vegetarianism could actually become the norm in the global North in the next decades without being a conscious choice for all consumers.

[67] Fiddes (1991), dates this back to a 19th century anti-cruelty movement. The modern movement is different from this, however, and puts humans more at the same level as animals, instead of assuming that cruelty is wrong only after absolute human needs have been satisfied, as was the case for the 19th century movement.

of the BSE crisis, but soon after, the figures fell towards what is more usual in France, i.e. 1-2% (Kjørstad, 2005).[68]

Framing matters considerably, and certain framings of an issue may not be felt so much as a threat (such as dangerous climate change), but more as an opportunity to do something good. For example, regarding changes in meat eating habits, Thon et al. (2012) concluded in their study on consumer responses to future scenarios regarding climate change that people could be more willing to change their habits - eat less meat, or eat artificial, lab grown meat - if this was presented as also saving them money or having animal welfare advantages, in addition to having climate benefits.[69] In fact, some very recent work on the relationship between the public and climate change communication emphasizes the importance of positive framing as regards changing attitudes and behaviour (e.g. Gutscher and Earle, 2012; Burford et al., 2012; Howell, 2012; Mathieu et al., 2012). However, the main reasons for a certain behaviour change should not be masked by too much tailoring to different audiences, with social marketing creating confusion (why are people encouraged to change their habits?), rather than cohesion towards change. Allying certain motives again ('Motivallianzen', see e.g. Belz and Peattie, 2009) can be useful in encouraging more sustainable behaviour, although there are enough clear and not uncertain reasons to consider the issue of meat consumption as a whole, and not in a piecemeal way as either a climate, animal welfare, resource or health issue. However, as Oosterveer (2012) argues, priorities regarding sustainability may change over time as a result of changing practices, scientific research, and public debates, and so probably will framings.[70] Furthermore, it may be easier for the public to understand and support an issue as a case for, for example, 'cows in the grasslands', rather than as a complex case against intensive farming, with its many associated problems (van Amstel et al., 2012).

Joy (2010) blames the media for having framed the meat discourse in a way that has often supported the *status quo*, by for example framing cases of clear animal cruelty in intensive agriculture as exceptions, omitting the discourse, or even sometimes prohibiting it. Williams (2008) believes that the lack of an extensive public discussion on factory farming is due, in part, to 'affected ignorance', i.e. of people choosing not to know, or find out, about what exactly it involves in terms of animal suffering.[71]

Regarding the disconnection between meat production and consumption, Gouveia and Juska (2002, pp. 384-385) argue that, in fact, the popular media has been lately falsely reconnecting production and consumption by 'framing food and cooking as a lifestyle' by discussing, for example, seasonal and locally produced foods, or engaging celebrity cooks to visit rustic small farms, while in reality, most food consumers are still faced with the same industrially produced supermarket meat. The reintegration of production and consumption is therefore

[68] Unfortunately, there is no reliable longitudinal data on the share of vegetarians in different EU countries available.

[69] Hoek et al (2011) found actually that the quality (or resemblance to meat) of meat substitutes matters more than the ethical arguments to eat such substitutes.

[70] Framings of food concerns in general have also varied in the last half a century, in the 1950's and 1960's they were about safety, convenience and prices, in the 1970's and 1980's they were about fertilizers and pesticides, in the 1980's and 1990's about risks and taste, and in the 2000's about animal welfare and fair trade (Spaargaren et al., 2012).

[71] Williams (2008) does not, however, discuss the role of media in this.

made into a 'matter of individual choice', while actually the two realms are perhaps even further distanced from each other with this framing.

Halkier (2010), on the other hand, argues that discourses about problematic food consumption and food overconsumption in general are in fact framed so that the consumers themselves are made responsible for solving the problems by changing their consumption habits. Halkier calls this framing 'challenged consumption'.[72] Halkier et al. (2007) makes a comparison between four European countries in terms of the discursive framings of food consumers, and concludes that there are fairly large national or cultural differences within Europe, and that conflicts in northern European countries may be more between different food related issues, such as food safety, quality, nutrition and ethics, and in southern European countries between different types of actors, such as public authorities, the food industry and the retail sector.

Lastly, the distrust that supposedly exists in the public mind about food, and meat in particular, brought about by various food related health scares, may, in fact, be more about a framing that does not have a true base in how consumers really feel about meat. Analysing the European consumer attitudes, Kjærnes and Torjusen (2012) do not find the expected levels of distrust, but instead, the modern, reflexive consumer is involved in *active trust* (Spaargaren et al., 2012) which is continually formed and build upon together with (pro)active policymakers, scientists and the food industry. However, Kjærnes and Torjusen find again some regional differences, in that consumers from southern and eastern Europe tend to be currently more pessimistic about food than especially Scandinavian consumers.

All in all, there seem to be significant differences in how issues to do with meat consumption are framed over time, in different geographical locations, or in different media. Considering the importance of framing, it is therefore no wonder that even within a somewhat similar 'western' context, i.e. Europe, with largely similar macro and micro level influences (see Section 5.1), and even when considering national averages, which always conceal local variability, there are still considerable differences in meat consumption trends. The last section of this paper will briefly present the idea of studying meat discourses in different contexts.

5.4 Analysing discourses

The purpose of the discourse analysis suggested in this paper is two-fold. The first goal is to see whether different framings could be identified in different country contexts regarding meat consumption and its alternatives. Can some of the differences in meat consumption trends be linked to how people discuss the topic of meat in different geographical or cultural locations, or over time? For example, how is the topic of meat framed in Finland where meat consumption is rising, vs. in the Netherlands where it is falling? Do the Dutch see themselves as pioneers in sustainable meat consumption, while the Finnas are focussing on pursuing

[72] According to Halkier (2010), the issue of challenged consumption raises four different types of research: "One where the focus is on how to steer consumers in societally 'correct' normative directions with their habits; one of research where it is assumed that consumers can enact societal agency and help change the world; one more pessimistic type where a main assumption is that consumers are being controlled and disciplined through the discourses on consumer agency; and finally, one where the complexities of consumption as everyday life phenomena are acknowledged in order to strike a balance between the enabling and the conditioning processes of this context" (Halkier, 2010, p. 169).

fashionable low-carb diets?[73] What about the Brits who keep on eating beef, as if there never was a BSE crisis in the country? Could maintaining traditions be behind their overall steady meat consumption? And what about the Spanish, is their meat consumption rising so much because meat is still identified with wealth, the country having risen from relative poverty not so long ago? This method can be called a *bottom-up method*, as it involves exploring data with no prior assumptions about particular discoveries.

The second goal is to explore the discourses from the risk frame point of view, presented in Section 5.2. This can be called a *top-down method*, as it involves a ready-made frame that is imposed on the discussion, as a reflection of the complex reality of the issue itself. The top-down method is intended to find out whether the discussion in different locations or in different times includes more of the risks than in other times or places, and how various risks are perceived by those discussing them. Is the current risk discussion in Finland, for example, mostly focused on health risks, and the discussion in the Netherlands on animal welfare? Or has there been steady discussion on a majority of the identified risks in both locations? Have the British turned away from discussing health risks, tired from the crisis they went through with BSE? Do the Spanish tend not to focus on meat related risks at all?

Loeber et al. (2011) argue that discourse analysis is a "fruitful way of bringing into view the way in which the natural, the technical and the socio-political are observable in continual processes of mutual simultaneous shaping" (p. 154). For example, in the Netherlands, Paul (2011) analysed the discourse related to the unusual response to the BSE crisis. In a particular combination of technocratic, economic, and individualistic discourses, or framings, the crisis created a much less politicised response than in other European countries. Further, dioxins found in milk in the Netherlands, got a completely different framing over time. First in the late 1980's, the problem was an environmental scandal, and when occurring again in ten years' time, the problem was framed as a 'food scare', at a time when the hole Dutch meat production industry was framed as disease-prone (due to the BSE crises), and with disrespect for animals (Bos et al., 2012).

Using the two methods discussed briefly above, textual data from major daily newspapers in, for example, a subset of the eight EU countries[74] can be studied, comparing a number of years over the past decades.[75] In such a project, it may be useful to collect all meat related news stories for analysis, and therefore a rather large amount of data may be available. Alternatively, as Barr (2011) suggests, it may be interesting to explore reactions to certain individual news stories that have appeared internationally in different countries, but more or less simultaneously. How different are the reactions to the same news among the people in the same cultural context or in different cultural contexts?[76] Barr argues that analysing such

[73] It could also be that the decrease in Dutch meat consumption has been a reaction to the intensive industrialisation of meat production in the country.

[74] Additionally, it could be interesting to look at a non-European country, in particular a country in the global South, such as India or South Africa, for example. The downside is that, although the FAO provides meat consumption data for most countries in the global South as well, there may not be as much comparative quantitative data available in terms of influences on the consumption of meat.

[75] Online archives are mostly available for the past two decades, at the most.

[76] The 'same news' can of course be presented differently, which must be taken into consideration in such analysis.

online discussion can provide important insight into the social construction of issues such as climate change or sustainable lifestyles. With this approach, probably only the bottom-up method, discussed above, can be applied, as the nature of the single news item already predetermines the range of issues that are likely to be discussed. The focus of the analysis is then on finding particular framings in the debate.

Whatever the precise approach, studying the issue of meat with discourse analysis should bring some interesting additional data to further investigate the question of what can make people reduce their meat consumption or accept alternatives to it.

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