

A Review of the Pork Food Chain

Summary Document

Acknowledgements

safefood would like to thank the following individuals for their participation in the External Advisory Group during the course of this review:

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- **Dr Geraldine Duffy**, Head Food Safety Department, Ashtown Food Research Centre, Teagasc.
- **Mr Martin Mullane**, **safefood** Scientific Advisory Committee.
- **Mr Keith Smyton**, Chief Executive, Ulster Pork and Bacon Forum.
- **Ms Róisín Talbot**, Supply Chain Development Branch, Department of Agriculture and Rural Development, Northern Ireland.

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- Irish Medicines Board.
- Millward Brown IMS.

Background, purpose and scope

The aim of this review is to address consumer concerns and to provide consumers with the information needed to make informed choices about the food they eat.

This review is the final in a series of food chain reviews that **safefood** conducted between 2005 and 2007. Previous reviews looked at the chicken, finfish, fruit and vegetables, beef and milk supply chains.

This review outlines the pork and pork product supply chain on the island of Ireland; the basic processes by which pork and pork products enter the consumer food chain; the controls in place to protect consumers from potential risks; and the nutritional and health benefits and risks of consuming pork and pork products.

The review covers raw, unprocessed pork products, for example pork loin, pork chops and pork roast; raw, processed pork products, for example bacon (including sliced bacon or 'rashers'), ham and sausages; and processed/heat-treated pork products, for example cooked ham.

This summary gives a brief overview of the findings of the review. A full report is available on the **safefood** website www.safefood.eu

Consumers and Pork

More pork meat per capita is consumed on the island of Ireland than any other meats including poultry, beef and mutton/lamb. Greater than 50 percent of pork meat consumed is in a processed variety. These varieties are mainly sausages, bacon/rashers and ham.

Consumers in general were confident in the integrity and safety of the supply chain and where there were concerns these centred on the health implications of processed products, which are high in fat and salt.

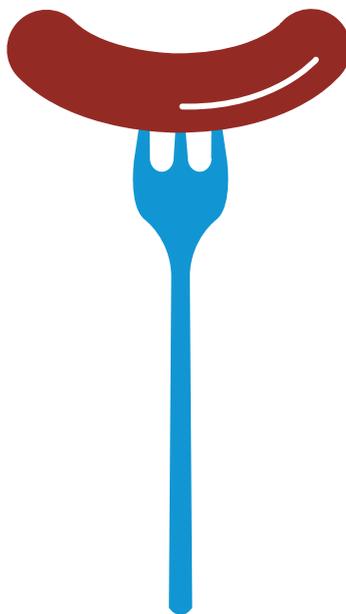
Research conducted on behalf of **safefood** for the review found that 85 percent of people on the island consume pork and pork products with consumers in Northern Ireland consuming slightly more than those in the Republic of Ireland. Almost one in five females (19 percent) claimed not to eat any pork products. Sausages and sliced ham were the most commonly eaten meats on a daily basis, but almost all pork meats and pork products were consumed at least once a week. When those who did

not eat pork were asked why not, the most common reason given was taste and this was particularly evident among consumers under 35 years of age. Fat was of particular concern to females and older participants, while salt was more of an issue for those over 35 years and those in higher socio-economic groups.

To further explore some of the issues, a number of consumer focus groups were held in Northern Ireland and the Republic of Ireland. The majority of participants felt that overall, pork was a relatively healthy meat and considered it to be more nutritious than beef or lamb though not as healthy as fish or chicken. Participants saw convenience, taste, versatility, lack of food 'scares' and value-for-money as strong positives in

the purchase and consumption of pork. Concerns raised by these groups included the high fat and salt content of processed products and their negative effects on cholesterol and blood pressure. Some respondents reported reducing their pork consumption for health related reasons.

There were no major food safety concerns about pork although most focus group participants acknowledged that pork products should be well cooked until there was no pink meat remaining. Respondents were fairly confident of the quality of the products they were buying and there were few concerns about the origin of pork with a general assumption that all pork sold on the island of Ireland was produced on the island.



The Supply Chain

Pork is the most popular form of meat consumed on the island of Ireland and also makes a valuable contribution to the economies of Northern Ireland and the Republic of Ireland.

In 2006 in Northern Ireland, pigmeat was estimated to account for almost seven percent of gross turnover in the food and drinks processing sector at £190 (€280) million. In 2007 in the Republic of Ireland, pigmeat production was valued at €290 (£198) million at farm gate representing five percent of the gross agricultural output and making it the third most important sector in agricultural output after beef and milk.

Production

Pork production systems on the island of Ireland are primarily conventional and comprise a small number of specialist producers operating large-scale units. Free range and outdoor production is minimal, while organic pork can be classified as a niche market. There were approximately two million pigs (410,450 and 1.59 million pigs in Northern Ireland and the Republic of Ireland, respectively) on the island of Ireland in June 2007.

Imports

Over one third of pigmeat consumed in the Republic of Ireland is imported, primarily sourced from the UK and continental Europe. A considerable proportion of imports coming into the Republic of Ireland are destined for further processing and eventual re-export as part of a final product. Approximately 40 percent of pigs slaughtered in Northern Ireland are imported from the Republic of Ireland.

Exports

Approximately half of the pigmeat produced in the Republic of Ireland is exported and was valued at €212 (£155) million in 2007. Export sales of pigmeat from Northern Ireland were valued at £96 (€141) million in 2005.

Retail

Retail sales of pigmeat are primarily via the large multiple chain supermarkets, although focus group participants tended to buy cuts such as bacon and roast joints from butchers. Moreover, focus group participants from Northern Ireland tended to purchase “speciality” sausages as opposed to supermarket brands all the time.

Based on data from the end of 2007 the total pigmeat market in the Republic of Ireland comprised of 34.3 percent of the overall retail meat market. Analysis of this market show that sales of pork are increasing on a yearly basis, in spite of a drop in number of pigs on the island.

In terms of the type of consumers of the various pork products, pork chops and rashers are purchased by young couples without children, sausages are favoured by families with young children, and bacon joints by consumers whose children have grown up and left the family home.

Food Safety and the Food Chain – from farm to fork

Foodborne illness is the result of the consumption of, or contact with, food that has been contaminated with some type of microbiological, biological, chemical or physical hazard.

Pork producers, processors, retailers and caterers take many steps to control both microbiological and chemical hazards and minimise the risk to consumers.

The safety of the pork supply chain is regulated by legislation primarily enforced by the Food Standards Agency (FSA) in Northern Ireland and the Food Safety Authority of Ireland (FSAI) in the Republic of Ireland.

Regulation of the Food Chain

Hygiene laws for EU Member States, commonly referred to as ‘The Hygiene Package’, cover all aspects of the food chain from a food hygiene perspective, including extensive measures to ensure the safety of pork and pork products from farm to fork. The Hygiene Package

also deals with imported pork. The regulation of suppliers and produce onto the EU market is the responsibility of the European Commission’s Food and Veterinary Office.

In the Republic of Ireland, the FSAI has service level contracts with the Health Service Executive (HSE) and the Department of Agriculture, Fisheries and Food to oversee the enforcement of the Hygiene Package and other national and EU legislative and safety programmes. The Department of Agriculture, Fisheries and Food is also responsible for the control of all pork and pork products from primary production through to the point of retail. Veterinary Inspectors from the Department also enforce EU standards through inspections at primary level

and also at slaughter in abattoirs. Local authority veterinarians are responsible for small establishments. The HSE, through its Environmental Health Officers (EHOs) have responsibility at the point where food enters a distribution network and retain control until final sale to the consumer.

In Northern Ireland, the FSA has similar service level agreements with local authorities through EHOs and Official Veterinarians, in enforcing the Hygiene Package and other food safety legislation.

If a health risk is discovered during the testing and monitoring of pork and pork products, an investigation will lead to the issuing of a food alert. If necessary, a food recall will be undertaken by the respective food safety agencies on the island.

A number of quality assurance schemes exist on the island of Ireland. The Northern Ireland Pig Quality Assurance Scheme (NIPQAS) is the quality scheme for pigmeat in Northern Ireland while the Bord Bia Pigmeat Quality Assurance Scheme (PQAS) operates in the Republic of Ireland. These schemes seek to provide assurances to buyers and consumers of the quality and safety of pork and

pork products on the island of Ireland by establishing standards to which participating producers must adhere.

Food-borne Illnesses Associated with Pork and Pork Products

Infectious intestinal disease in humans arising from the consumption of pork is uncommon and is preventable with the adoption of correct hygiene practices. However, the consumption of raw or undercooked pork can pose a risk of infection as does the cross-contamination of ready to eat foods with bacteria from raw pork or its juices.

Salmonella is a major organism of concern with respect to the pork supply chain. Out of 21,000 samples of raw pork and raw pork products tested over the years 2003–2004 in the Republic of Ireland, *Salmonella* was detected in 2.1 percent of samples. One particular strain *Salmonella* Typhimurium was the most commonly isolated type.

In 2008, a *Salmonella* Agona outbreak, possibly attributed to pork, took place on the island of Ireland and in Great Britain. This outbreak was being investigated at the time of this review.

Other pathogens of note along the pork food chain include *Staphylococcus aureus*, *Listeria monocytogenes*, and *Clostridium botulinum*. There have been no cases or outbreaks associated with any of these organisms on the island in recent years. Pork meat and processed pork products have also been associated with other foodborne diseases such as yersiniosis and trichinellosis that are rare on the island but more common in other areas of the world. With the increased nature of the global food supply chain and greater ethnic diversity, these infections may become more frequent in the future.

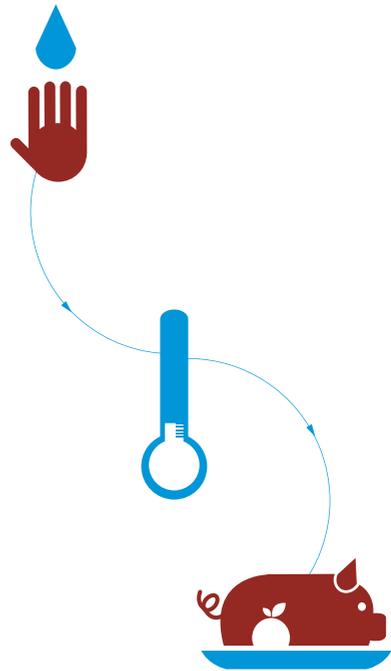
Antimicrobial resistant bacteria have been detected in pork-derived products and subsequently in humans. Illnesses caused by multi-drug resistant species are more difficult to treat as they limit the range of antibiotics that can be used.

The control of *Salmonella* along the food chain is a challenge for all stakeholders involved and there has been considerable investment placed in this area. Control schemes to minimise the incidence of *Salmonella* species in pigs are in place in Northern Ireland and the Republic of Ireland. While the schemes differ to some extent in the approach taken, both are based on the testing of pigs for *Salmonella* at the time of slaughter. Certain restrictions are placed on herds with a high number of positive samples before they enter the food chain.

These control schemes are currently under review and the importance of an all-island approach to such a control scheme is underlined by the fact that almost 40 percent of pigs slaughtered in Northern Ireland originate in the Republic of Ireland.

Contaminants and Residues

The incidences of chemical contamination or residues in pork are rare and are largely confined to the primary production level. They can include veterinary medicinal products and feed additives, as well as environmental contaminants. There is comprehensive monitoring of potential chemical contaminants entering the pork food chain by the respective competent authorities on the island. With regard to veterinary medicinal products, residue levels found in pork in both Northern Ireland and the Republic of Ireland from authorised medicines were below those considered to be of human health concern. With respect to growth hormones, both Northern Ireland and the Republic of Ireland reported no evidence of the use of banned products in pork in respective monitoring programmes. Such results highlight the safety and integrity of the pork production systems on the island.



Nutrition and Health

On average, pork has a lower total and saturated fat content than other red meats such as beef and lamb.

As well as being low in saturated fat, pork is a rich source of iron and essential nutrients such as phosphorous, zinc, potassium, magnesium and the B vitamins.

On a daily basis more than 50 percent of pork products eaten on the island of Ireland are processed varieties, for example sausages, bacon and ham, which are almost always high in salt and will vary in their fat and meat content.

Consumption Levels

Pork is the most consumed meat in the world being consumed by more than one in three people, rising to one in two in Europe. On the island of Ireland per capita consumption of pork is higher than that of other meats including poultry, beef and sheep meat.

According to the North South Ireland Food Consumption Survey (NSIFCS) in 2001, men in the Republic of Ireland consume 167g per day and women consume 101g per day of pork and processed pork meats. Men also tend to consume significantly larger portions of meat than women.

The majority of pork eating occasions in the survey were identified as being in the home. Furthermore, pork consumed in the home was greater in quantity than that in the workplace and was significantly greater when compared with the commercial food service sector.

In Northern Ireland the 'Eating for Health' survey found that 45 percent of individuals reported consuming processed meat products (including sausages, bacon, meat pies, pastries and chicken nuggets) once or twice per week.

Results from the National Children's Survey in the Republic of Ireland in 2004 have indicated that primary school aged children are consuming almost twice as much processed meats when compared with leaner cuts of fresh meat.

Coronary Heart Disease

Dietary saturated fat and salt are two of the major contributors to cardiovascular disease.

There is convincing evidence that sodium intake, mainly through dietary salt is directly associated with increased blood pressure. Cured and processed meats contribute to approximately one fifth of current salt intake. Analysis of the NSIFCS indicated that bacon and ham were the meats which contributed the most to daily salt intakes at 0.925g/day.

A relatively modest reduction in salt intake has important beneficial effects on blood pressure which in turn can result in a decrease in stroke and coronary heart disease mortality.

Pork and pork products vary in their fat and saturated fat content. Individuals who consume pork can decrease their total fat and saturated fat intake and thus reduce their risk of cardiovascular diseases by choosing leaner cuts more often than fattier processed cuts.

The balance of the diet can also significantly affect health outcomes. Diets on the island of Ireland high in red meat also tend to have higher intakes of processed meat and be lower in fruit and vegetables and fibre thus increasing the risk of cardiovascular disease. In some Mediterranean regions, there is evidence of a lower prevalence of cardiovascular disease in populations that are high consumers of lean red meat but also high consumers of fruit and vegetables.

In response to health concerns regarding salt levels in foods and more specifically a negative focus on processed meat products, the pork industry is moving to respond to some of these concerns.

As well as product innovation and the introduction of reduced fat and salt pork products on to the market, producers and retailers have been working with regulators since 2003 in Northern Ireland and the Republic of Ireland to reduce the levels of salt in pork products, with the aim of reaching these targets by 2010.

Cancer

In 2007 the World Cancer Research Fund/American Institute for Cancer (WCRF/AICR) published strong evidence of a relationship between red meats and specifically processed meats and a number of cancers.

The WCRF/AICR recommended that consumers who eat red meat should consume less than 500g* (cooked) a week, very little of any to be processed and that the population goal should be an average consumption of red meat of no more than 300g (cooked) a week very little of which to be processed.

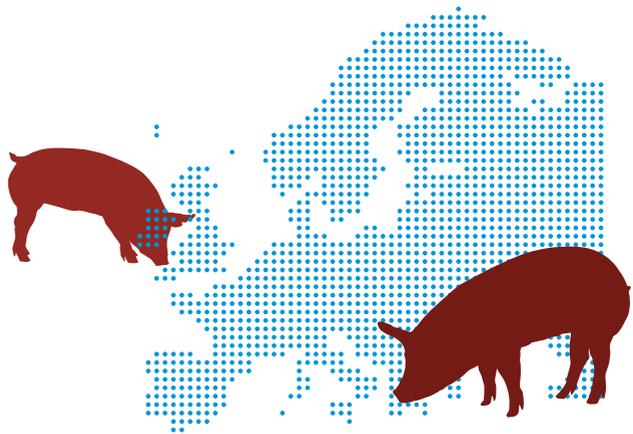
However, in making these recommendations the expert panels recognised the valuable contribution that lean red meat, such as pork, can make to the diet particularly in relation to iron, vitamin B₁₂ and protein.

While the current dietary advice on the island supports the recommendations of the WCRF/AICR, due to the large consumption of processed pork products a more realistic achievable interim goal for many people would be to make a gradual reduction in the intake of processed meats.

* 500g is equal to 1.1 pounds and 300g is 0.6 pounds of meat

Key Findings

- More pork meat per capita is consumed on the island of Ireland than any other meats including poultry, beef and mutton/lamb. However, greater than 50 percent of pork meat is consumed is in a processed form.
- Eighty-five percent of people on the island consume pork and pork products with consumers in Northern Ireland consuming slightly more than those in the Republic of Ireland.
- In 2006 in Northern Ireland, pigmeat was estimated to account for almost seven percent of gross turnover in the food and drinks processing sector at £190 (€280) Million.
- In 2007 in the Republic of Ireland, pigmeat production was valued at €290(£198) Million at farm gate representing five percent of the gross agricultural output and making it the third more important sector in agriculture output after beef and milk.



- All pork meat and pork products must be thoroughly cooked with no pink meat remaining.
- The importance of an all-island approach to control schemes to minimise the incidence of *Salmonella* species in pigs is underlined by the fact that almost 40 percent of pigs slaughtered in Northern Ireland originate in the Republic of Ireland.
- More than 50 percent of pork products eaten on the island of Ireland are processed varieties, for example sausages, bacon and ham.
- On average pork meat has a lower total and saturated fat content than other red meats such as beef and lamb and is also a rich source of essential nutrients such as phosphorous, zinc, potassium, magnesium and the B vitamins.
- In response to health concerns regarding salt levels in foods and more specifically a negative focus on processed meat products, the pork industry is moving to reduce the levels of salt in pork products by 2010.
- Consumers are urged to make a gradual reduction in their intake of processed meats and introduce more lean, fresh cuts into their diet.