Comparison of the Regulatory Framework and Key Practices in the Poultry Meat Supply Chain in the EU and USA

A Study for

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Association of Poultry Processors and Poultry Trade in the EU Countries

Undertaken by ADAS UK Ltd in conjunction with
The University of Arkansas

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1. INTRODUCTION

1.1 The TTIP between EU and the USA

The transatlantic trade and investment partnership (TTIP) currently being negotiated aims to secure a free trade agreement between the European Union and the USA. The negotiations include a focus on the alignment of regulations and standards and thus go further than simply removing tariffs and opening markets.

The TTIP process began with initial talks in 2013. Discussions between the European Commission and the US Trade Representative are on-going at present. Within the EU, the European Council and the European Parliament are also involved in the negotiating process and will be required to approve the text negotiated by the Commission, at the end of the process.

According to a European Commission document[1], the TTIP agreement focuses on three key elements namely:

- ***Market access**, through the removal of duties on goods and restrictions on services*, so improving market access and facilitating investment;
- ***Improved regulatory coherence and co-operation***, by dismantling unnecessary regulatory barriers;
- ***Improved co-operation*** on setting international standards.

The same Commission document points out that there are often different regulatory structures and traditions in place in the EU and USA and that these can impede market access. It also states that the EU *'is only discussing standards and regulations with the US on one strict condition: that we neither give up nor dilute the levels of protection we have in Europe'.*

The Commission document goes on to confirm that regulatory alignment and mutual recognition *'will only be possible if real convergence on the required safety and environmental standards is guaranteed'.*

The poultry meat sector is considered to be a sensitive one within the TTIP. The EU has proposed legal text on sanitary and phytosanitary (SPS) measures within the TTIP negotiations. In addition, the EU's proposal for legal text on regulatory co-operation in TTIP includes animal welfare at Article 17. The proposed text states that the parties will:

- Recognise that animals are sentient beings and that they will respect trade conditions for live animals and animal products that aim to protect their welfare;
- Undertake to exchange information, expertise and experiences in the field of animal welfare, with the aim to align regulatory standards related to breeding, holding, handling, transportation and slaughter of farm animals;
- Strengthen their research collaboration in the area of animal welfare to develop adequate and science-based animal welfare standards related to animal breeding and the treatment of animals on the farm, during transport and at slaughter.

Poultry industry organisations such as the Association of Poultry Processors and Poultry Trade in the EU (AVEC) and representative bodies within different EU Member States have raised concerns about the possible impact of a TTIP agreement on the future of the EU poultry meat sector and on meeting consumer preferences and expectations in future. The poultry meat sector in the EU is highly-regulated and the issue of ensuring equivalent standards in the EU and USA is therefore especially important.

[1] The Transatlantic Trade and Investment Partnership (TTIP) – TTIP Explained

1.2 Overall Objectives of this Study

The overall objective of this study is to provide a comparison of regulatory requirements and key practices in the poultry meat supply chain in the EU and the USA. The study has been undertaken by ADAS UK Ltd working in conjunction with researchers from the University of Arkansas, who have co-ordinated and supplied information on requirements and practices in the USA.
The emphasis is on providing clear and factual information covering the key areas of:

- **Poultry meat production systems** for breeding and growing farms, hatchery practices, transport and supply chain requirements, including testing and monitoring;
- **Poultry feed supply**, with particular reference to raw materials, additives, manufacturing, sampling and testing;
- Slaughter and processing, with particular reference to hygiene, inspection, testing and other aspects of food quality and food safety (e.g. chilling, water content etc.).

In addition to legislation that applies throughout the EU (in the form of regulations and directives) and throughout the USA, (federal law), stricter regulatory requirements may apply in particular EU Member States and in certain parts of the USA. In view of this, the scope considers country-specific requirements and key practices in France, Germany and Poland (as the three EU Member States with the largest poultry meat outputs) where these exceed EU legislation. This was carried out in conjunction with representative bodies in these countries. For the USA, state-specific requirements have been considered for Georgia, Arkansas and Alabama, which have the largest poultry meat outputs in the USA.

In the absence of legislation in key areas, consideration has been given to the existence, scope and uptake of major voluntary schemes operating nationally (USA) or EU-wide.

Whilst the project identifies the main areas of difference between the EU and the USA, the likely impacts of these are not quantified in financial terms.

2. SUMMARY OF KEY FINDINGS

The main findings for the EU and USA are set out in this section. The information provided here is based on the individual EU and USA reports which are presented as Appendices 1 and 2.

2.1 Industry Scale and Regulatory Approaches

The output of the USA poultry meat sector (chicken and turkey) was some 27 million tonnes in 2015[2], compared to 13.9 million tonnes in the EU. Indeed, with an annual output approaching 9 billion (9,000 million) broilers, the USA is the largest poultry meat producer in the world. However the difference in scale between the USA and the EU sectors has reduced in recent years, since there has been more rapid expansion in poultry meat production in the EU.

Average per capita consumption of poultry meat in the USA has recently been relatively static but consumption levels still far exceed those of the EU, where there has been a gradual increase in consumption. In recent years, poultry meat exports have become increasingly important to the USA but there has been a lack of trading with the EU.

[2] USA data in pounds (lb) has been converted to metric tonnes

The largest poultry meat producing state in the USA is Georgia which produces around 3.1 million metric tonnes. Alabama and Arkansas both have outputs only slightly lower than this. Production in Georgia exceeds that of the largest EU Member State, Poland, which produced some 2.1 million tonnes of poultry meat in 2014.

In the EU, the regulatory approach is founded on treaties that set out EU objectives and according to the concept of the 'precautionary principle'. The Treaty of Lisbon, which entered into force in 2009 recognised animals as sentient beings and requires all Member States to pay full regard to animal welfare requirements. EU legislation can be in the form of 'regulations' (which must be applied in their entirety in all Member States) and 'directives' (which set out objectives that must be achieved through individual Member State legislation). Responsibilities for EU overall objectives are divided between different departments, known as Directorate Generals (DGs). These include the DG for Agriculture, the DG for Health and Food Safety and the DG for the Environment. Each Member State has responsibility for enforcement of legislation within its territory, but the DG for Health and Food Safety has an overall role for carrying out audits and inspections within Member States. This aims to ensure that EU legislation is being properly implemented and enforced throughout the EU.

In the USA, the regulatory approach is based on the Constitution which is the supreme law and the basis for federal (national) legislation. The Constitution also sets out the rights and responsibilities of the states in relation to federal government. In practice, there are two levels of regulation – the federal and the state. Federal law prevails due to the 'supremacy clause' which is part of the Constitution. The US Department of Agriculture (USDA) is responsible at national level for formulating policy on farming, food, natural resources and food safety. Its objectives are accomplished through some 17 different agencies and other offices including the Food Safety Inspection Service (FSIS), the Agricultural Marketing Service (AMS) and the Animal and Plant Health Inspection Service (APHIS). In addition, the Food and Drug Administration (FDA) which is part of the Department of Health and Human Services is responsible for food safety legislation and for protecting public health. The Environmental Protection Agency of the federal government has primary responsibility for protecting the environment and sets national standards that states must enforce through their own legislation.

2.2 Comparison of Poultry Meat Production Systems

Within this section, a comparison is made between EU-wide and USA legislation in relation to animal welfare (on-farm and during transport), animal health and environmental controls.

2.2.1 Animal Welfare

In the EU, legislation (Council Directive 98/58) sets out general rules for the protection of animals on the farm, including poultry. Those considered to have most relevance to poultry kept in environmentally-controlled, loose-housing systems include the following:-

- Sufficient number of staff with appropriate competence, stock inspection at least daily;
- Any medicinal treatment must be recorded;
- Housing materials must be capable of being thoroughly cleaned and disinfected;
- Automatic or mechanical equipment to be checked at least daily with an alarm and back-up in place for use in the event of system failure;
- Wholesome feed and access to suitable water to be provided.

Specific minimum rules apply to the protection of chickens kept for meat production in the EU (Directive 2007/43), but this does not apply to turkeys or ducks. Under this legislation, maximum stocking densities for chickens are specified, in terms of the total liveweight per square metre of available floor space. A maximum of 33 kg of liveweight per m^2 applies in general, but higher stocking densities are allowed in a house or holding if additional requirements are met. If they are, the maximum stocking density may potentially increase in steps (by derogation) to 39 and then finally to 42 kg/m^2. Member States may decide not to adopt these higher levels within their own countries.
The same Directive requires all broiler houses to comply with a range of requirements including the following:

- Permanent access for birds to litter which is dry and friable on the surface;
- At least 20 lux light intensity over 80% of the useable area during the light period;
- Lighting must follow a 24 hour rhythm, with darkness lasting at least 6 hours in total.

If stocking densities above 33kg liveweight per ma are used, ammonia concentrations must not exceed 20ppm and carbon dioxide must not exceed 3000ppm.

In the USA, there are currently no federal regulations to control or safeguard the welfare of animals used in agriculture. An Animal Welfare Act is in place but it applies only to animals kept for non-farming purposes. State laws govern animal welfare in some parts of the country but currently no such legislation applies to poultry in any of the three major poultry-producing states considered here (Georgia, Alabama and Arkansas). In the absence of legislation, voluntary welfare standards apply and those of the USA National Chicken Council are almost universally adopted. Contractual arrangements within the supply chain are said to serve as a powerful incentive for compliance with these.

The National Chicken Council provides guidance on a range of issues in relation to animal welfare, including stocking density where the equivalent of between 36 and 37 kg per m2 must not be exceeded for chickens between 2 and 2.5 kg liveweight. The maximum density allowed increases for heavier birds. The same guidance also contains provisions for staff training and alarm systems and requires the following:

- The light pattern must include at least four hours of darkness in each 24 hour period (except for the first and last week);
- Light intensity during 'light hours' equivalent to approximately 5 lux;
- A maximum ammonia level of 25ppm.

In the EU, animal welfare during **transport** is addressed within legislation (Regulation 1/2005). For poultry, this includes:

- A maximum journey time without feed and water of 12 hours, excluding loading and unloading time (separate limits apply to chicks within 24 hours of hatching);
- A specified space allowance during transport, in terms of square centimetres per kg, based on the liveweight of the bird.

For journeys of over 65km, the same legislation requires drivers and attendants in the EU to possess a certificate of competence, whilst a transporter authorisation is required for journeys of over 8 hours.
In the USA, there is legislation on transportation in the form of the 'Twenty Eight Hour Rule'. This prohibits transportation of animals for more than 28 consecutive hours but there are no specific regulatory requirements covering space allowance during transport. Furthermore, the standards of the National Chicken Council (referred to above) do not include specific guidance figures on either transport time or space allowance.

2.2.2 Animal Health

Within this area, we have concentrated on legislation and practices in relation to Salmonella and on notifiable diseases, specifically Avian Influenza.

In the EU, a framework of legislation on ***Salmonella*** has targeted a reduction in the incidence of *Salmonella Enteritidis and Salmonella Typhimurium* in broilers, breeders and turkeys. Legislation (including Regulation 2160/2003) has been implemented across Member States through National Control Plans and additional national legislation. Principle requirements include registration of premises, minimum sampling requirements for breeders, broilers and turkeys and compulsory slaughter of breeding flocks found to be *Salmonella* positive.

In the USA, there is no industry-wide legislation on *Salmonella* but a strong and long-established voluntary program is in place. This is part of the National Poultry Improvement Plan (NPIP) which becomes mandatory if inter-state and/or export commerce is undertaken. Supervision of the NPIP is by the USDA and administration throughout the country is by state regulatory agencies. Testing for *Salmonella* in breeding stock is included in the NPIP program and the requirements vary according to the term used to describe the status of the breeding flock in respect of *Salmonella*. The program does extend to other parts of the poultry sector, including poultry meat farms but there are no specific requirements for sampling and testing for *Salmonella* on poultry meat growing farms.

For **Avian Influenza**, the EU has specific legislation (including Directive 2005/94) on preventative measures relating to surveillance and early detection of disease and on minimum control measures. This legislation covers all poultry (and game bird) species. Whilst these are highly prescriptive, Member States can exercise risk-based judgements on a case-by-case basis. EU legislation sets out:

- Requirements for disease surveillance;
- Control measures following a suspected outbreak and in the event of an outbreak;
- The basis upon which vaccination may be used, although this is generally prohibited.

In the USA, control of Avian Influenza is also included within the USDA National Poultry Improvement Plan (see above) and the scope extends to all commercial poultry, waterfowl, game birds and slaughter plants. Key elements of the Avian Influenza Control Plan in the USA include:

- Surveillance, extending to wildlife and migratory bird populations, broiler flocks prior to slaughter, live bird markets and backyard flocks;
- Monitoring, through routine surveillance at each participating slaughter plant;
- Control measures following a suspected outbreak and in the event of an outbreak;
- The basis upon which vaccination may be used in compliance with OIE requirements (vaccination of broilers is not allowed under any circumstances).

2.2.3 Environmental Controls

In the EU, all poultry farms which exceed a threshold size of 40,000 bird places are required through legislation to hold an **environmental permit** (Directive 2010/75). Operators are required to carry out activities in compliance with their environmental permit and they must use 'Best Available Techniques' (BAT) in order to achieve a high level of environmental protection. These techniques are set out in a BAT Reference Document. Larger poultry processing plants and waste incineration plants are also within the scope of the same legislation.

In the USA, legislation (in the form of the Clean Air Act) requires all farms with over 125,000 broilers to have an environmental permit. For broiler farms, the main issue is the spreading of used litter. To obtain a permit, farmers must maintain a nutrient management plan, written by a certified professional. This must set out arrangements for used litter management, storage, application and movement and include nutrient analyses of used litters and soils. In locations where there are particular concerns regarding excesses of specific nutrients in soils (e.g. phosphorus), land-spreading activities may be restricted. Poultry slaughter operations are generally required to have a discharge permit in line with USDA requirements, in respect of waste water.

Environmental impact assessments (EIAs) are required by legislation in the EU for all installations with over 85,000 broiler places (Directive 2011/92). Smaller farms and installations for the slaughter of animals may also require such an assessment at the discretion of the Member State. In the USA, only activities which are wholly or partly-funded by federal (or state) monies require an EIA. This may apply to the construction of facilities such as feed mills and processing plants which may be partially funded by government grants. Where projects are funded entirely by private finance, EIAs are not required in the USA.

In the EU, **the disposal of poultry** that die on the farm during the course of the normal production cycle is controlled by legislation (Regulation 1069/2009). Permitted disposal methods are specified. These include on-farm incineration (subject to approval from the competent authority) and off-farm disposal methods via a licensed disposal operator. In the USA, carcass disposal is regulated by individual states. The methods allowed vary between states. In addition to the use of incineration and rendering, composting of carcasses is allowed and often undertaken as a means of carcass disposal. On-farm burial is allowed in parts of the USA (e.g. in Georgia and Arkansas but not in Alabama) although it is not commonly undertaken. The use of disposal pits is allowed in Georgia. By contrast, on-farm burial, composting of poultry carcasses and the use of disposal pits are prohibited in the EU.

2.3 Comparison of Poultry Feed Supply

This comparison of EU and USA practices has concentrated on specific aspects, including Salmonella and hygiene measures, raw materials and additives / medications.

For ***Salmonella*** in the EU, National Control Plans (as referred to earlier) extend to feed production whilst general hygiene requirements in the animal feed chain are also set out in legislation (EC Regulation 183/2005). Within this, all feed business operators are required to implement and maintain written procedures based on HACCP principles. In the USA, there are no regulatory requirements for Salmonella monitoring at feed mills, but voluntary programs are in place. The Federal Food, Drug and Cosmetic Act in the USA includes animal feed in its scope and requires feed to be produced under sanitary conditions and to contain no harmful substances. There is no requirement for HACCP-based systems in the USA but good manufacturing practice (GMP) is required and feed mills must maintain records of ingredients and medications.

The use of **processed animal protein (PAP)** such as meat and bone meal in poultry feeds is prohibited by legislation in the EU (Regulation 1069/2009), although certain low-risk materials of animal origin (non-poultry), such as processed fishmeal and calcium phosphates are permitted. In the USA, meat and bone meal is allowed in feeds for poultry. There are no regulatory controls on how these are produced but several HACCP-based voluntary programs can be followed.

In relation to **genetically-modified organisms (GMOs)**, the EU imports the vast majority of the soya and maize required for poultry feeds from third countries, including the USA, Brazil and Argentina. These are likely to contain a (probably high) proportion of GMOs. Within the EU, legislation requires GMOs to be authorised (Regulation 1829/2003) before they can be marketed or grown and Member States can decide whether to allow cultivation within their territories. The authorisation procedure includes a safety assessment by EFSA.

In the EU, legislation is in place for the authorisation, supervision and labelling of **additives** in animal feeds (Regulation 1831/03). Since 2006, there has been an EU-wide ban on the use of antibiotics for use as growth promoters in all animal feeds, including poultry. From December 2016, the use of antibiotics at sub-therapeutic levels is scheduled to be prohibited in poultry feeds in the USA, under the Veterinary Feed Directive.

2.4 Comparison of Stunning and Slaughter

EU legislation (Regulation 1099/2009) requires the use of approved **stunning** methods for poultry. This requirement extends to slaughter houses in third countries that export meat to the EU. Permitted methods include water bath stunning (minimum electrical requirements apply for chickens and turkeys) and controlled-atmosphere stunning (including a range of gas mixtures). For the EU, the same legislation also sets out requirements for:

- The layout, construction and equipment within slaughter houses;
- The appointment of an Animal Welfare Officer, accountable for implementing animal welfare measures;
- Training of staff who handle live animals in slaughterhouses and the possession of a certificate of competence;
- Killing animals for disease control purposes.

In the USA, the effectiveness of the slaughter process is referred to within federal regulations which require poultry to be slaughtered *'in accordance with good commercial practices in a manner that will result in thorough bleeding of the carcasses and ensure that breathing has stopped prior to scalding'.* This is generally interpreted as requiring stunning but there is no specific legislation. Furthermore, the Humane Slaughter Act does not apply to poultry and unlike the EU, there are no specific minimum requirements in legislation for the electrical currents to be used in water bath stunning.

In the USA, the Poultry Health Veterinarian or other authorised personnel is required to perform a routine inspection of slaughter procedures at least once each shift for every day on which birds are killed, to ensure that slaughter is being undertaken according to legislative requirements and good commercial practices.

2.5 Comparison of General Food Hygiene Requirements

In the EU, control of **food hygiene** is through general legislation (Regulation 852/2004) together with specific hygiene rules for food of animal origin (Regulation 853/2004) and for official checks (Regulation 854/2004). The general rules establish the principle of food safety throughout the food chain, starting at the farm and the implementation of procedures based on HACCP principles. For farmers, this means control of hazards and the adoption of measures to safeguard human health e.g. facilities for primary production must be kept clean and where necessary disinfected after use.

Post-farm, requirements are set out in legislation for the layout, design and construction of food premises (e.g. processing facilities), whilst vehicles and containers transporting foodstuffs are to be kept clean and provide protection from contamination. The rules on food of animal origin do not apply on-farm, but specific hygiene requirements for meat from poultry include the following:

- **During transport of live birds:**
  - Careful handling without causing distress;
  - Crates and modules must be easy to clean and disinfect;
  - Prior to re-use equipment must be cleaned, washed and disinfected.

- **For slaughter houses, there are requirements for:**
  - Construction, layout and equipment;
  - Slaughter hygiene;
  - Hygiene during and after cutting and boning;
  - On-farm slaughter.

In the USA, federal legislation requires HACCP systems to be in use at FSIS-regulated poultry slaughter and processing plants. Regulatory Sanitation Performance Standards have been established by FSIS and are published in the Federal Register. These are applicable to all official poultry establishments. They set out the objectives to be achieved, whereas an accompanying Compliance Guide for these Performance Standards sets out methods which are likely to be compliant.

The key regulatory objectives relevant to poultry processing facilities include the following:

- **Grounds and facilities:**
  - Pest management and pest control substances;

- **Construction:**
  - Sound construction, kept in good repair, sufficient size;
  - Walls, floors and ceilings built of durable materials, cleaned and sanitised as necessary;
  - Separate rooms for edible and inedible product to prevent adulteration and the creation of insanitary conditions;

- **Sanitary operations:**
  - All surfaces (food-contact and non-food contact) to be cleaned and sanitised as frequently as necessary;
  - Cleaning compounds and other chemicals must be safe and effective;
  - Product protected from adulteration during processing, handling, storage and during transportation;

- **Employee hygiene:**
  - Adherence to hygienic practices to prevent adulteration of product;
  - Outer clothing that is disposable or readily cleanable.

In the USA, the Poultry Products Inspection Act (1957, as amended) requires the USDA (FSIS) to undertake inspections to ensure that slaughter and processing takes place under sanitary conditions and to prevent misbranding. For inter-state sales and exports, FSIS inspectors must be on-site continuously.

Regarding **carcass decontamination**, only potable or clean water can be used in the EU to remove surface contamination from products of animal origin. Whilst there is a legal basis for allowing the use of alternative substances, at present no other decontamination treatments are authorised for poultry in the EU. In the USA, the Code of Federal Regulations provides approval for food grade substances for use in poultry and an FSIS Directive lists safe and suitable ingredients that may be used. All procedures must be approved by the USDA to ensure that they are equal to or better than carcasses that have not been treated. Currently, over 40 chemicals and chemical mixtures have been approved for use as poultry carcass decontaminants in the USA.

2.6 Marketing

Marketing standards for poultry in the EU set out legal definitions for grade A and for various poultry cuts. Fresh poultry meat must include a 'use-by' date and there are specifications for the temperature of frozen poultry and for the chilling of fresh produce. For poultry cuts, the total water content must be assessed and specified water-to-protein ratios must be met, according to cut (with or without skin) and method of chilling.

The EU also has health rules that cover the importation and trade of meat-based 'preparations' and 'products' (these terms are defined in legislation). Poultry meat products can be imported to the EU only from a third country verified as having fulfilled all basic animal and public health requirements and with a suitable disease surveillance programme for notifiable diseases.

In the USA, standards of wholesomeness set out in federal legislation for poultry (the Poultry Products Inspection Act) must be met. Grading is voluntary and most commonly used for whole birds. If undertaken, the specific regulatory standards for the assigned grade (A, B etc.) must be met. Legislation is in place in respect of labelling of poultry and to prevent misleading or false claims. FSIS legislation requires that if any water is retained on poultry products during chilling, there must be a statement of the retained water content on every pack (e.g. 'contains up to x% retained water). If data are available to demonstrate that products do not retain water, this statement is not required.

In the EU, microbiological criteria for foods including poultry meat are set in legislation (Regulation 2073/2005). This requires the absence of *Salmonella* in neck samples from chickens and turkeys after chilling. In the event of unsatisfactory results, improvements to slaughter hygiene, processing controls and/or farm practices may be required. A possible change to this legislation which would also establish hygiene criteria for *Campylobacter* is under consideration. In the USA, performance standards have been set for *Salmonella* and *Campylobacter* at processing plants and samples must be collected at least weekly from the largest processing premises. These are then categorised according to the results obtained. To be placed in the highest category for whole broiler carcasses, premises must demonstrate less than 4.9% *Salmonella* positives or less than 7.8% for *Campylobacter*.

Country of Origin labelling (COOL) is required in the EU by legislation (Regulation 1337/2013). Similar legislation was introduced in the USA in 2013 but this was repealed in 2015 and it is now not used.

2.7 Additional Requirements at EU Member State and USA State Level

The existence of additional national legislation (over and above EU legislative requirements) has been considered for France, Germany and Poland, as the three largest poultry meat producing countries in the EU. The most significant additional requirements are summarised below.

In France, new poultry units with over 30,000 birds require a specific impact study, to set out the effect of the proposal on the environment. Furthermore, the use of small-scale incineration of carcasses on the farm is not permitted. Both of these requirements exceed EU legislation in relation to environmental protection. Litter from poultry houses cannot be re-used for successive flocks, nor can it be utilised in anaerobic digestion or as a fuel source for electricity generation.

In Germany, the maximum stocking density that can be used for chickens is lower than the EU maximum level, at 39 kg per m2 or 35 kg for chickens up to 1.6 kg liveweight. Under the terms of a government / industry scheme, maximum stocking densities are specified for turkeys (separately for stags and hens). All new buildings for chicken production must include windows – this is not specified in EU legislation. Maximum ammonia and carbon dioxide levels which apply to higher stocking densities in EU legislation apply to all chicken flocks in Germany.

Transport legislation in Germany provides slightly more floor space per bird than the allowances set out in EU legislation and in addition, minimum crate heights are specified, based on average bird liveweight. Farmers in Germany are required to pay a fee for a new environmental permit (note that such fees are set at Member State level and not by the EU). The use of small-scale incineration of carcasses on the farm is not permitted and all fallen stock must be sent for rendering. In respect of notifiable disease, farmers pay a compulsory insurance fee but can then receive compensation payments in the event of an outbreak.

In Poland, a national limit is placed on the stocking density for ducks. Payment must be made by farmers for environmental permits and flock owners must bear the costs of pre-slaughter, live bird inspection which takes place on the farm. In most other respects, production in Poland follows the requirements of EU legislation.

For the USA, the existence of additional controls over and above federal requirements has been considered for **Alabama, Arkansas and Georgia**, as the three largest poultry meat producing states in the USA. It is concluded that there is no relevant local legislation in any of these states on animal welfare on the farm or during transport. Furthermore, only federal legislation applies in these states in relation to food hygiene and poultry meat marketing. It has been noted however that environmental controls are delegated to state level. As a result requirements differ, both between states and within states, partly reflecting the significance of local environmental issues. Approved methods of carcass disposal are determined at state level. Hence, burial of carcasses is allowed in Arkansas and Georgia but not in Alabama, whilst disposal pits are allowed only in Georgia.

3. CONCLUSIONS

The poultry meat sector is large and expanding, both in the EU and the USA but at present, there is little direct trading between the two.

This report has identified some areas where legislative controls and commercial practices are similar but others where there are differences between the EU and the USA. Some of these differences have implications for relative costs of production of poultry meat and these would be important in the context of international trading between the two areas. There are also implications for consumers of poultry meat (in terms of farm and product standards) and for the public in general, for example due to differences in environmental controls. Some of the key elements are discussed in this section which concentrates on implications for the EU poultry meat sector.

3.1 Comparison of Legislation

Table 1 below sets out the main subject areas considered within this study and outlines the relevant legislative requirements for the EU. The extent to which there are similar controls in place in the USA is then summarised. This is done mainly with reference to legislation but voluntary controls which operate at national level (such as the National Chicken Council animal welfare guidelines) are also referred to.

Further detail on these points is provided elsewhere in this report and in particular, in the separate Appendices (1 and 2) which cover the sectors in the EU and USA respectively.

Table 1 - Summary Comparison of Legislation Requirements in EU and USA

Subject	Requirements in EU Legislation	Equivalent Controls in the USA
General protection of poultry	Buildings and accommodation must be capable of thorough cleaning and disinfection	Not in legislation but in commercially accepted, voluntary standards
	No sharp edges likely to cause injury	Not in legislation but in commercially accepted, voluntary standards
	Ventilation system back-up required	Not in legislation but specified in NCC animal welfare guidelines
	Sufficient numbers of staff, stock inspected at least daily	Not in legislation but twice daily stock inspection specified in NCC animal welfare guidelines
Specific welfare requirements on the farm	Maximum stocking density for broiler chickens set by legislation (33-42kg /m^2;according to prevailing factors)	Not in legislation but maximum stocking density is included in NCC animal welfare guidelines (36-37 kg/m^2 for chickens between 2.04 and 2.49kg)
	Permanent access to litter which is dry and friable on the surface	Not in legislation but specified in NCC animal welfare guidelines
	Light intensity (20 lux) and lighting pattern (24 hour cycles, 6 hours darkness) set by legislation	Not in legislation but included in NCC animal welfare guidelines; light intensity 5 lux and at least 4 hours darkness
	Maximum ammonia (20ppm), carbon dioxide and relative humidity levels apply if the higher stocking densities are used	Not in legislation but ammonia specified in NCC animal welfare guidelines (25ppm)
Welfare requirements in transport	All animals must be fit to travel	Not required by regulation but by commercially accepted, voluntary standards
	Maximum journey times (12 hours excluding loading and unloading time) are set by legislation	Maximum journey time of 28 consecutive hours excluding loading and unloading. Maximum transport time not specified in NCC animal welfare guidelines
	Space allowances per bird during transport are specified according to liveweight	Space allowance not specified in legislation, NCC guidelines require that birds are able to sit in a single layer
	Systems of authorisation and certification are in place for drivers and attendants	Not required in legislation
Salmonella control on farms	Legislation in place covering farms, hatchery, feed manufacture and processing; implementation through National Control Plans in each Member State	Program in place for much of the poultry sector as part of the National Poultry Improvement Plan; this is mandatory for inter-state and export commerce, supervised by USDA and administrated by state regulatory agencies.
	Compulsory testing of breeders, chickens and turkeys; slaughter of breeding stock if found to be positive	National Poultry Improvement Plan sets out a number of different testing regimes for breeder flocks
	Legislation in place for surveillance, control measures (including compulsory slaughter) and vaccination	USDA National Poultry Improvement Plan in place and mandatory for inter-state and export commerce.

Subject	Requirements in EU Legislation	Equivalent Controls in the USA
Environmental controls	All farms over 40,000 birds must have an environmental permit, based on the use of Best Available Techniques for all aspects of production	Farms with over 125,000 chickens discharging litter and waste water to land must have an environmental permit based on nutrient management plans written by a certified professional
	Environmental impact assessment is required for all new developments over 85,000 broiler places	Not required by federal regulation unless federal funding is involved
	Disposal of fallen stock by approved methods only; these exclude composting, on-farm burial and the use of disposal pits	Disposal is regulated by individual states; only approved methods allowed but these can include composting and (in some states) on-farm burial and the use of disposal pits
Poultry feed	Only specified animal by-products may be used, no meat and bone meal	Meat and bone meal is permitted in poultry feeds, no relevant legislation in place but HACCP-based voluntary programs are available
	No antibiotic growth promoters may be used	From December 2016, the use of antibiotics at sub-therapeutic levels for control of growth will be prohibited
	Compounders must implement and maintain HACCP systems	No legislative requirement for HACCP in feed manufacturing
	Only approved additives and medicines may be used	Only approved additives and medicines may be used
Stunning, slaughter, processing	Approved stunning methods set in legislation	Stunning methods not specified, the Humane Slaughter Act excludes poultry
	Minimum electrical requirements for water bath stunning are specified	Not specified in legislation
	Layout, construction and equipment within slaughter houses is covered by legislation	Layout, construction and hygiene are included within the USDA Sanitary Requirements, with Compliance Guides also in place
General food hygiene	'Farm to fork' approach is adopted with procedures based on HACCP principles	HACCP procedures are required for slaughter and further processing of poultry products
	Hygiene requirements are in place for primary production (farms) and transport of live animals	No federal legislation for food hygiene in relation to farms and transport
	Additional hygiene requirements set out for food of animal origin	Some additional requirements set out in legislation (Poultry Products Inspection Act)
Carcass decontamination	Use of approved substances only and at present, no decontamination treatments other than water are authorised for poultry in the EU	Use of approved substances only, according to USDA regulation; over 40 different ones are approved for use in poultry
Poultry Meat Marketing	Class A is defined in legislation	Class A is defined but its use is optional
	Maximum water absorption percentages are specified for carcasses	Any retained or added water as a result of processing method must be stated on the label according to USDA regulation.

ADAS

Subject	Requirements in EU Legislation	Equivalent Controls in the USA
	Maximum permitted water to protein ratio is specified in legislation for cuts.	No comparable legislation
	Country of origin labelling required	Country of origin labelling legislation repealed so now no longer used
	Microbiological criteria require the absence of *Salmonella* in neck samples; *Campylobacter* currently under consideration for inclusion	Performance standards set for *Salmonella* and *Campylobacter* in inspected facilities; premises are categorised based on the level of positive results

3.2 Discussion of Practical and Financial Implications

Using the EU as a basis, it can be seen that there are some key differences with the USA in terms of the overall legislative process. These include the following:

- The EU has a stated objective of recognising animals as sentient beings and of paying full regard to animal welfare requirements. The USA does not have anything equivalent to this.
- The concept of the 'precautionary principle' is stated and used in the EU but not in the USA. In the EU, it provides a basis for regulatory control and it establishes an approach whereby policies or actions which may cause harm are not pursued.
- In respect of food safety, the EU adopts a 'farm-to-fork' approach with measures being set out in legislation throughout the supply chain, starting with the farm. This supply chain approach is less apparent in the USA.

Legislative requirements impact upon how farms, food businesses and ancillaries (including feed compounders and live bird transporters) are set up and how they operate. In some cases, costs may be borne by businesses as a result of legislation, both in terms of capital and operating costs. An assessment of such costs is outside of the scope of this study but the significance of it was reported in a study commissioned by AVEC in 2013 . For 2011, this report estimated that EU regulations added 4.79 eurocents per kg liveweight (equivalent to 5.1%) to total production costs. One element of this difference related to the EU ban on the use of antibiotic growth promoters which will soon also be prohibited in the USA. The difference of 0.80 eurocents which was attributed to this at the time should therefore cease to be relevant. Differences in slaughter house costs were not considered in this study.

To demonstrate some of the practical impacts of differences in legislation between the EU and the USA, a series of individual examples is presented below. These concentrate on areas where EU legislation differs from that of the USA with the result that it influences commercial practices in some part of the supply chain. It is accepted that some or all of these practices may also be adopted at least by a proportion of the industry in the USA, on a voluntary basis.

Clean-out between Production Cycles

Animal welfare legislation in the EU requires poultry houses to be capable of being thoroughly cleaned and disinfected. To comply with food hygiene legislation, primary production facilities such as farms must be kept clean. In practice, this means that poultry houses must have solid (not earth) floors and that used litter must be removed each time that houses are de-populated. Houses are then cleaned and disinfected before the next flock of day-old chicks is placed. These procedures are consistent with achieving good physical performance and maintaining biosecurity standards, but

[3] Competitiveness of the EU poultry meat sector, LEI Report 2013-068 (Wageningen)

they increase the capital cost of buildings and the need for litter materials; houses are also likely to be empty for longer between flocks which reduces the annual throughput of birds.
In the USA, food hygiene legislation does not reach back to the farm. Litter may not always be removed between flocks and so houses cannot be properly cleaned. Turnaround times may therefore be shorter, annual throughput increased and operating costs for cleaning, litter disposal and replacement reduced.

Poultry House Environment
In the EU, maintaining an intensity of at least 20 lux in houses during light hours and allowing 6 hours of darkness in each 24 hours is likely to negatively impact upon growth rates and increase feed consumption, particularly compared to the use of lower light intensities. Increases in feed consumption (when not associated with a concomitant increase in growth) are important in economic terms since feed represents by far the largest single cost item in poultry meat production. In the USA, where there are only voluntary controls over light intensity and hours of darkness (and where these are less stringent than in the EU), the different requirements are likely to be associated with reduced costs.

In order to meet legislative requirements for ammonia, carbon dioxide and relative humidity in poultry houses in the EU, additional emphasis is needed on litter management, ventilation control and heat supply for young chicks. These all have cost implications for EU producers. Equivalent legislative controls do not exist in the USA which suggests that US farmers are likely to enjoy a cost advantage in this area compared to their EU counterparts.

Environmental Permitting
The introduction of environmental permitting legislation has set higher standards for poultry housing in the EU and in some cases it has forced older sites to modernise and to improve their farms e.g. throughout containment of clean-out water. This is because farms with over 40,000 birds must comply with defined 'Best Available Techniques' for all farm activities. In addition to capital cost implications, more management time may be required for record-keeping and inspection and in some Member States, payment is required in respect of permitting. It is noted that whilst an environmental permitting regime does exist in the USA, a higher threshold unit size of 125,000 applies (although it is likely that the vast majority of farms will still be subject to permitting requirements). However, the scope of permitting requirements in the USA is much narrower, in that the focus is on land-spreading rather than also covering housing issues as is the case in the EU. Some cost differences are likely to arise from this difference in scope.

Poultry Feed
The use of meat-and-bone meal was commonplace in feeds for poultry before it was prohibited by EU legislation. If permitted, it is likely that it would still feature in feeds if formulated on a purely 'least-cost' basis and subject to customer approval. A potential cost advantage therefore currently lies with countries such as the USA where the use of meat-and-bone meal is still allowed and is undertaken.

Salmonella Control
The EU has set challenging requirements for the control of Salmonella, both through the National Control Plans and by specifying the absence of Salmonella from neck samples after chilling. A recent report indicated that for EU countries operating control programs, the incidence of Salmonella in broiler flocks before slaughter was 3.7%. The same report found that the incidence for the EU as a whole increased to 7.5% at retail level, with some important differences between Member States. For the USA, a recent report concluded that Salmonella was isolated from 13% of retail chicken samples in 2013.

To comply with legislative requirements for Salmonella control – and to achieve the reported incidence levels - it has been necessary for the industry in the EU to adopt a comprehensive and integrated approach throughout the supply chain, involving farms, feed suppliers, processors and others. Maintaining hygiene standards, the adoption of best practice, sampling and analysis and record-keeping all form part of this approach. It is recognised that there are cost implications for the industry in respect of all of these which may not always apply in the USA.

[4] EFSA Journal – EU Summary Report on Zoonoses, Zoonotic Agents and Food-Borne Outbreaks, 2013

Carcass Decontamination

By prohibiting the use of antimicrobial substances to decontaminate poultry carcasses in the EU and allowing only water to be used, the control emphasis is clearly focused on preventing contamination. Indeed, EFSA state a concern that allowing the use of other substances could mask unhygienic practices and induce resistance of the micro-flora present on the surface of the treated products.
The preventative 'farm-to-fork' approach required because of this is consistent with some of the actions and practices set out above, in relation to house clean-out and Salmonella control in particular. The additional costs for the EU which are likely to be associated with this preventative approach are again acknowledged and contrasted with the USA.

In conclusion, it can be seen that many elements of the poultry meat supply chain are regulated through precise and specific legislation in the EU. At present, equivalent national legislative controls are not apparent throughout the USA in a number of areas but voluntary standards may apply instead. In the context of TTIP, it appears that further negotiations are needed in order to achieve the 'regulatory alignment' that the European Commission seeks.

[5] NARMS Integrated Report:2012-2013
http://www.fda.gov/downloads/AnimalVeterinary/SafetyHealth/AntimicrobialResistance/NationalAntimicrobialResistanceMonitoringSystem/UCM453398.pdf
ompetitiveness of the EU poultry meat sector, LEI Report 2013-068 (Wageningen)

APPENDIX 1

POULTRY MEAT REGULATORY FRAMEWORK AND PRACTICES IN THE EU

1. POULTRY MEAT PRODUCTION AND CONSUMPTION IN THE EU

The scale of poultry meat production in the EU is large and has increased substantially in recent years, driven by increases in *per capita consumption* (see Table 1). The key advantages of poultry meat compared to other meats include lower production costs (meaning affordability and good value to consumers), convenience, healthy image and sustainability benefits (lower greenhouse gas emissions). Finally, there are no religious restrictions which prevent consumption.

Table 1 - Total Poultry Meat Output and Consumption in EU, 2010 to 2015

	Total Poultry Meat Carcass weight (million tonnes)	Index (total weight trend)	EU per capita consumption of poultry meat (kg)
2010	12.57	100	20.5
2011	12.92	103	20.7
2012	13.18	105	21.2
2013	13.37	106	21.3
2014	13.86	110	22.0
2015	14.41	115	22.5

Source: Avec Annual Report 2016, data based on EU Commission and other sources

For 2014, chicken production accounted for just over 11 million tonnes of the total for poultry meat shown in Table 1 (78%) with turkey meat at 2.029 tonnes (14%) and duck at 0.499 tonnes (4%). The major poultry meat producing countries within the European Union in 2014 were Poland (2.56 million tonnes per year), France (1.835), Germany (1.785) and UK (1.59), which together accounted for some 55% of the EU total output. For chicken production alone, output was led by Poland (2.06 million tonnes per year), followed by UK (1.385) and Germany (1.255).

Turkey and duck production in the EU are both concentrated in a small number of Member States. For turkey meat, five countries (Germany, France, Italy, UK and Poland) produce more than 80% of all EU turkey meat. For duck meat, France produces nearly half of the EU total (45%) and together with Hungary and Germany, these three countries produce just over 70% of the EU total.

Whilst overall per capita consumption of poultry meat has been increasing, there is considerable variation within the EU at present. Member States such as Portugal, Spain, Hungary and Ireland each consume over 30kg per person per year, whereas Germany, Italy and other smaller countries all consume less than 20kg per person.

Poultry is the only meat for which a significant expansion in production and consumption is forecast for the EU between 2014 and 2024[6]. This expansion is predicted to be around 7% over this 10 year period. Key drivers in this trend are expected to be increased per capita consumption, together with a small overall increase in EU population.

Overall, the EU is typically self-sufficient in poultry meat and in recent years, EU poultry meat production has accounted for between 100% and 104% of EU consumption. Within this, there can be surpluses and shortages (e.g. a surplus of dark meat and a shortage of white) and thus there are both imports and exports with third countries. The countries to which the EU imports most poultry meat are currently Brazil and USA. In 2014, imports from the USA were some 3.3 thousand tons.

Major countries importing poultry meat from the EU now include Japan and Saudi Arabia. At present, the USA does not feature as a major exporter of poultry meat to the EU. The use of chemical (anti-microbial) treatments for poultry carcasses in the USA which are not permitted in the EU provides one explanation for this. However, the USA is still a relevant player to the EU in terms of competition for other potential export markets, including Russia, South Africa and China.

2. THE EU REGULATORY APPROACH

The EU regulatory approach is founded on treaties that set out EU objectives. If a policy area is not cited in a treaty, the Commission cannot propose a law in that area. The following distinction is made between EU Regulations and Directives:

- A Regulation is a binding legislative act which must be applied in its entirety throughout the EU;
- A Directive is a legislative act that sets out an objective that must be achieved in all EU Member States; individual countries are able to devise their own legislation in order to meet these needs. They can also adopt legislation which exceeds EU requirements.

The concept of the 'precautionary principle'[7] provides a basis for regulatory control in the EU. It establishes an approach to risk management whereby a policy or action which may cause harm to the public or the environment (or where there is no scientific consensus) should not be pursued. Once more scientific information becomes available, the situation should be reviewed.

Within the Commission, EU overall objectives are divided between different departments, known as Directorate Generals or DGs. The three most relevant to the technical issues covered within this study are outlined below.

2.1 DG for Agriculture and Rural Development (DG AGRI)

The stated overall aim of this DG is to promote the sustainable development of Europe's agriculture and to ensure the well-being of its rural areas. EU farm policy serves many purposes, including helping farmers to produce sufficient quantities of food for Europe, ensuring that food is safe and protecting the environment and animal welfare. DG AGRI has involvement in marketing standards, specific farming systems, preparing market access offers and the promotion of agricultural products on the internal and external market.

[6] Based on data from 'Prospects for Agricultural Markets and Income in the EU 2014-2024', The European Commission, DG AGRI, December 2014 (http://ec.europa.eu/agriculture/markets-and-prices/medium-term-outlook/2014/fullrep_en.pdf)

[7] Set out in Article 191 of the Treaty on the Functioning of the European Union

2.2 DG for Health and Food Safety (DG SANTE)

Key aims of this DG include protecting the health and welfare of farm animals and ensuring that food is safe and wholesome. Farm animal health issues are also within its remit, with control methods in place for certain animal diseases. DG SANTE plays a role in multilateral and bilateral international relations, when concluding agreements regarding sanitary and phytosanitary measures.

Animal welfare is considered a priority for the EU and this DG notes that legislation has evolved over many years on the basis of sound scientific knowledge and in accordance with citizens' expectations and market demands. The Treaty of Lisbon which entered into force in 2009 included a revised version of the 1997 Protocol on Protection and Welfare of Animals (the treaty of Amsterdam). It stated the following:

> *«in formulating and implementing the Union's agriculture, fisheries, transport, internal market, research and technological development and space policies, the Union and the Member States shall, since animals are sentient beings, pay full regard to the welfare requirements of animals, while respecting the legislative or administrative provisions and customs of the Member States relating in particular to religious rites, cultural traditions and regional heritage.»*

It can be noted that there are similarities between this text and that in the proposed Article 17 in relation to TTIP.

The EU has developed strategies for improving animal welfare standards and for ensuring that these are applied and enforced throughout the European Union. The strategy is also intended to improve the competitiveness of EU agricultural products, by ensuring that markets and consumers recognise animal welfare as an added value.

On food safety, the DG states that the Commission's guiding principle is to adopt and apply an integrated approach from 'farm to fork'. This is coupled with adequate monitoring, so ensuring the effective functioning of the internal market. The implementation of this approach involves the development of legislative and other actions. These are intended to:

- Assure effective control systems and evaluate compliance with EU standards in food safety and quality, animal health, animal welfare and animal nutrition within the EU and in third countries in relation to their exports to the EU;
- Manage international relations with third countries and international organisations concerning these same issues;
- Manage relations with the European Food Safety Authority (EFSA)[8] and ensure science-based risk management.

The Health and Food Safety DG is also tasked with helping consumers to make informed choices about their food, through EU quality-labelling schemes. These labels – indicating geographical origin and the use of traditional ingredients or methods (such as organic farming) – are also intended to help make EU farm products competitive on world markets.

2.3 DG for Environment (DG ENV)

The stated overall aim of this DG is to protect, preserve and improve the environment, with policies in place to ensure a high level of environmental protection and to preserve the quality of life. A series of 'Best Available Techniques Reference Documents' (BREFs) have been adopted which cover a wide range of activities. Intensive rearing of poultry, together with slaughter and processing facilities (as part of food, drink and milk industries) are included within the scope of the BREFS. DG ENV also represents the European Union in environmental matters at international meetings.

[8] EFSA was established as an agency of the EU in 2002. It operates independently of legislative institutes and EU Member States, providing independent scientific advice and communication on existing and emerging risks associated with the food chain.

2.4 DG for Trade

The Directorate-General for Trade conducts the EU's common policy on trade with countries beyond the EU borders. Included within this are trade negotiations with countries outside the EU, improving market access for exporters and importers, ensuring that fair practices are applied to international trade and assessing the environmental and social impacts of trade.

2.5 Enforcement of Legislation in the EU

Each Member State within the European Union has responsibility for the effective enforcement of legislation within its territory through a competent authority . It must allocate sufficient resources to achieve this. In most Member States, farm animal welfare policy is the responsibility of a ministry of agriculture but practical enforcement is often supported by a separate inspection service or by a completely separate body. In federal states (such as Germany) inspection duties are devolved to regional inspection services.

The DG for Health and Food Safety has an overall responsibility for carrying out audits, inspections and other activities with Member States, aimed at ensuring that EU legislation is properly implemented and enforced across all countries. The scope of these inputs includes food and feed safety, animal health and animal welfare. In effect, this provides a check that the national authorities in each Member State are fulfilling their legal obligations within the European Union.

Within DG SANTE, this work is now undertaken by the Directorate on Health and Food Audits and Analysis (previously by the Food and Veterinary Office or FVO). It involves a combination of site audits, desk-based exercises and through collation of Member State data. Where audits are undertaken, they focus on the control system in place within the country, rather than on the individual premises visited and they culminate in a written report. Details of the activities undertaken and the outcomes are available to be viewed on the European Commission website.

3. PRODUCTION SYSTEMS

This section focuses on EU legislation on animal welfare on the farm and during transport, animal health and environmental controls that affect the poultry meat sector.

3.1 On-Farm Animal Welfare

The key legislation that applies is Council Directive 98/58 [10] and Council Directive 2007/43 [11].

3.1.1 General Protection of Farm Animals under Council Directive 98/58

General rules for the protection of all animals kept for the production of food or other farming purposes are set out in Council Directive 98/58. The requirements take an overview and 'all-systems' approach to protecting animals and are therefore not specific to poultry. However, they do apply throughout the European Union and the scope includes chickens, turkeys and ducks.

The legislation acknowledges the need to establish common minimum standards and states that differences could interfere with the smooth-running of markets. It also refers to animal welfare provisions in the EU and in non-member countries and to the need to eliminate distortions of competition. The Directive allows Member States to apply stricter provisions to protect farm animals if required.

[10] Council Directive 98/58/EC concerning the protection of animals kept for farming purposes;
[11] Council Directive 2007/43 laying down minimum rules on the protection of chickens kept for meat production;

Directive 98/58 requires Member States to ensure that all reasonable steps are taken by farmers to prevent unnecessary pain, suffering or injury to animals. Member States are required to carry out farm inspections and to report to the Commission on the number of inspections made and the key outcomes.

An annex to the Directive sets out the animal welfare provisions to be met for all species. Those considered to have most relevance to poultry kept in loose-housed systems, with controlled ventilation are summarised in Table 2 below.

Table 2 - Main Requirements for Poultry based on Annex 1 of Council Directive 98/58

Topic	Requirements
Staff and inspection	Sufficient number of staff with appropriate competence; Stock inspection at least daily in systems which require frequent human attention; Ill or injured animals must be cared for and veterinary advice obtained.
Record-keeping	Any medicinal treatment must be recorded.
Freedom of movement	Freedom of movement must not be restricted in a way that will cause unnecessary suffering or injury.
Buildings and accommodation	Materials (particularly those that may come into contact with animals) must be capable of being thoroughly cleaned and disinfected; No sharp edges or protrusions likely to cause injury; Air circulation, dust levels, temperature, humidity and gas concentrations must be kept within limits which are not harmful to the animals.
Automatic or mechanical equipment	All such equipment must be inspected at least once daily and any defects rectified (or other steps taken); Ventilation systems which safeguard the health and welfare of animals must include a back-up for use in the event of system failure, together with an alarm which provides a warning and is tested regularly.

3.1.2 Welfare of Broilers under Council Directive 2007/43/EC

Council Directive (EC) 2007/43 is under the competence of DG SANTE and it sets out minimum rules for the protection of chickens kept for meat production. These are much more specific than those outlined above in section 3.1.1. There is no equivalent specific legislation for turkeys or ducks and so for these, the more general requirements of Directive 98/58 set the legislative standards.

The legislation (often referred to as the 'Broiler Directive') has been implemented throughout the EU since 2010 and it is considered to be the first time that 'welfare indicators'[12] have been included in animal welfare legislation as a means of objective assessment. The Directive sets specific maximum stocking densities for broilers for the first time and gives individual Member

[10] Council Directive 98/58/EC concerning the protection of animals kept for farming purposes;
[11] Council Directive 2007/43 laying down minimum rules on the protection of chickens kept for meat production;
[12] Welfare indicators are intended to enable objective measurements to be made of the health and well-being of animals. Measures can be based on behavioural or physiological traits; they can also use animal welfare outcomes such as pododermatitis or gait scoring as indicators

States the discretion to apply stricter limits. In addition, requirements relating (for example) to lighting, litter, feeding and ventilation are also included within the scope, aimed at ensuring better animal welfare. The Broiler Directive applies to chickens on holdings with more than 50 birds but extensive indoor and free range production (including organic rearing) is excluded [13].

The Directive considers stocking density in terms of the total live weight per square metre of available floor space (kg/m2) and three different levels are stated. A maximum of 33 kg of liveweight per m2 generally applies, but higher stocking densities may be allowed in a house or holding if additional requirements are met. If they are, the maximum stocking density may potentially increase in steps (by derogation) to 39 and then finally to 42 kg/m2. Whether to allow stocking densities which exceed 33 kg/m2 is a decision for each individual Member State and it must be controlled by the competent authority within that country.

These stocking densities apply regardless of whether or not flocks are 'thinned' (partially de-populated). This practice is adopted on many farms in order to optimise the use of growing space.

Annexes to the Broiler Directive set out specific requirements for all houses and the key ones are outlined in Table 3 below:

Table 3 - Broiler Directive Requirements Applicable to All Broiler Houses

Topic	Requirement
Feeding	Feed shall be either continuously available or be meal-fed and must not be withdrawn from chickens for more than 12 hours before the expected slaughter time.
Litter	All chickens shall have permanent access to litter which is dry and friable on the surface.
Ventilation	Ventilation shall be sufficient to avoid overheating.
Light	All buildings shall have lighting with an intensity of at least 20 lux during the lighting period, measured at bird eye level and illuminating at least 80% of the useable area. The lighting must follow a 24-hour rhythm and include periods of darkness lasting at least six hours in total. There must be at least one un-interrupted period of darkness of at least 4 hours.
Inspection	All chickens must be inspected at least twice each day. Chickens that are seriously injured or show evident signs of health disorder, such as those having difficulties in walking, severe ascites or severe malformations, and are likely to suffer, shall receive appropriate treatment or be culled immediately. A veterinarian shall be contacted whenever necessary.
Record keeping	The owner or keeper shall maintain a record for each house of a holding showing the number of birds, the useable area and the number of dead birds.

[13] Requirements for free range meat production are included in separate legislation which sets out marketing standards. These are under the competence of DG AGRI. There are separate requirements and legislation for organically-reared poultry. Because the market share of these is generally small and they are less likely to be subject to trading with third countries, they are not included within this report

For stocking densities over 33kg and up to 39kg/m2, the intention to stock at this level must be reported to the competent authority in the particular Member State. There are a number of additional requirements placed on producers using higher stocking densities, including documenting the production system and the internal dimensions of the building as well as maintaining and calculating daily and cumulative daily mortality rate. These data must subsequently accompany the flock to the slaughter house for evaluation. The official veterinarian at the slaughter house also assesses flocks on arrival and *post-mortem*.

Additional requirements for stocking densities up to 39 kg/m2 also refer to the control of environmental parameters in particular and these are summarised in Table 4 below.

Table 4 - Additional Broiler Directive Requirements for Houses with Higher Stocking Densities up to 39 kg/m2

Topic	Requirement
Ammonia and carbon dioxide	Ammonia concentration not to exceed 20 ppm and the concentration of carbon dioxide not to exceed 3000 ppm measured at chicken head height;
Inside temperature	When the outside temperature measured in the shade exceeds 30°C, the inside temperature should not exceed outside temperature by more than 3°C;
Average relative humidity	The average relative humidity measured inside the house during 48 hours does not exceed 70% when the outside temperature is below 10°C.

In addition to the above and the requirements already set out in Tables 2, 3 and 4, Table 5 below summarises the extra criteria that must be met for broiler chicken stocking densities of up to 42 kg/m2.

Table 5 - Additional Broiler Directive Requirements for Houses with Stocking Densities up to 42 kg/m2

Topic	Requirements
Past Record	No deficiencies in respect of Directive requirements for at least two years; Satisfactory cumulative daily mortality rate in at least seven consecutive flocks from a house (below 1% + 0.06% multiplied by slaughter age in days).

3.2 Animal Welfare during Transport

The key legislation that applies is Council Regulation 1/2005[14]. This applies to all live vertebrate animals transported within the European Community in connection with an economic activity. Amongst other things, it includes specific limits on journey times, it provides space allowance figures for the livestock being transported and it sets out requirements for the vehicle and the driver.

Under the Regulation, no unnecessary suffering should be caused to the animals during transport. The text states that *'no animal shall be transported unless it is fit for the intended journey, and all animals shall be transported in conditions guaranteed not to cause them injury or unnecessary suffering'*.

[14] Council Regulation (EC) 1/2005 on the protection of animals during transport

The legislation allows Member States to apply stricter measures on welfare during transport within their own countries, if they wish.

For chickens being transported for slaughter, (and also for turkeys and ducks and for breeding stock moved to laying premises) the legislation requires that suitable food and water must be made available if journey times exceed 12 hours (not including loading and unloading time). Given the practical difficulties of providing such supplies, transport time is typically limited to this 12 hour maximum. For very young stock being transported to farms from the hatchery, the maximum journey time allowed is 24 hours for chicks, turkey poults and ducklings, provided that this is completed within 72 hours after hatching.
Space allowances for poultry during transport are set out in Table 6 below.

Table 6 - Summary of Space Allowances for Poultry during Transport

Category	Area (cm^2) per bird
Day-old chicks	21-25 per chick
Poultry other than day-old chicks: liveweight in kg	**Area (cm^2) per kg liveweight**
Less than 1.6kg	180-200
1.6kg to less than 3kg	160
3kg to less than 5kg	115
Over 5kg	105

Based on the figures in Table 6, it can be calculated that a 2kg liveweight chicken would have a floor area of 320cm2 during transport; an 8kg liveweight turkey would have 840cm2 of floor area. However, the Regulation states that these figures for poultry may vary, not only based on the weight of the birds but also on their physical condition, the weather conditions and the likely journey time.

For journeys of over 65km, drivers and attendants must possess a certificate of competence which is issued at Member State level. For long journeys of over eight hours, transporters must also apply for and obtain a type 2 transporter authorisation. Additional requirements which are applicable to the transportation of poultry are set out in Table 7 below.

Table 7 - Additional Transport Requirements for Fitness to Travel and Documentation

Topic	Requirements
Fitness for transport	No animal to be transported unless it is fit to travel; The means of transport are to be designed, constructed, maintained and operated so as to avoid injury and suffering and ensure the safety of the animals.
Documentation	This must show the origin and ownership of the animals, the place of departure and destination, the date and time of departure and the expected duration of the journey.

Under this legislation, Member States are required to approve the 'certificate of competence' process for drivers and attendants. They must establish systems and approvals for transporter authorisations. Finally, they are required to provide an annual report to the Commission on animal transport inspections made each year and an analysis of the major deficiencies identified.

3.3 Animal Health

This section concentrates on legislation and practices in relation to Salmonella and on notifiable diseases such as Avian Influenza.

3.3.1 *Salmonella* Control on the Farm

Salmonellosis remains one of the most prevalent zoonotic diseases in humans. The *serovars* of greatest significance to public health are *Salmonella Enteriditis* (SE) and *Salmonella Typhimurium* (ST), both of which are often linked back to poultry products.

The EU poultry industry operates within a strict and comprehensive framework of legislation aimed at reducing the incidence of SE and ST in broilers, breeders and turkeys. Regulation 2160/2003[15] provided the initial framework of minimum standards for *Salmonella* reduction and included maximum target levels of incidence, sampling procedures, reporting requirements and follow-up procedures in the event of *Salmonella* infection being detected.

This Regulation and subsequent EU legislation were implemented across Member States through individual National Control Plans (NCPs) and additional national legislation. Following on from the 2003 Regulation, a number of other pieces of legislation have been introduced that (amongst other things) have updated targets for *Salmonella* control in breeders (2010), broilers (2011) and turkeys (2102). Further additional legislation applies to Salmonella control in hatcheries, feed mills and processing.

The practical requirements of meeting Salmonella control legislation are extensive and require considerable and continuous management intervention in planning, implementation, monitoring and reporting. These are set out in the NCPs which are the cornerstone of Salmonella control processes across the EU and set out how the individual Member States address the legislative requirements to reduce or maintain the incidence of Salmonellas of public health significance to target levels.

In addition to the various impacts of implementing NCP requirements, identifying Salmonella at any point within the production process (i.e. feed mill, hatchery, breeder flock, and broilers) has significant implications in terms of production disruption and additional management time and effort. For breeder birds, identification leads to the slaughter of the flock and the destruction of non-incubated hatching eggs in the hatchery.

Whilst the practical implementation of Salmonella control legislation may vary slightly between different Member States in accordance with their individual NCPs, the principal requirements are the same irrespective of national boundaries (see Table 8). For commercial broiler and turkey flocks, S. Enteritidis and S. Typhimurium (at least) must be included whilst for breeding flocks, these and three other frequently-occurring *salmonella* serotypes must be included.

[15] Regulation (EC) 2160/2003 of the European Parliament and of the Council on the control of salmonella and other specified food-borne zoonotic agents

Table 8 - Principal Requirements for Salmonella Control in Poultry Flocks

	Principal Requirements
National Control Plans for Poultry Flocks	Registration of premises
	Routine veterinary supervision of farms
	Adherence to relevant guidelines produced by the competent authority e.g. hygiene management of farms
	Record keeping on farm and relevant measures to ensure traceability of animals
	Minimum sampling requirements : • Breeder rearing flocks at day old, four weeks and two weeks before moving to laying farm • Breeder laying farms every second week during the laying period • Broilers (and turkeys) – at a maximum of three weeks prior to slaughter
	Compulsory slaughter of breeding flocks (including chicks and rearers) found to be *Salmonella* positive
	Destruction of non-incubated hatching eggs if breeder flock is found to be positive

Allied poultry industry operations (hatcheries, feed mills, processing plants, rendering plants) are also highly regulated in relation to *Salmonella* control under a variety of other legislation. These place similar requirements for registration of premises, adherence to codes, monitoring and reporting. Interventions and controls in the event of *Salmonella* being detected are also specified.

3.3.2 Control of Avian Influenza

The European Commission introduced specific legislation on Avian Influenza (AI) in the form of a Council Directive in 1992[16] . The global increase in the incidence of AI (including outbreaks across Europe) led to an update of this founding legislation in 2005, through the introduction of Council Directive 2005/94[17]. This introduced strengthened and extended measures, developed from increasing scientific knowledge on the subject and from the practical experience gained in dealing with AI across Europe and in third countries. This Directive in conjunction with other related legislation (e.g. on issues such as slaughter and transport of dead animals etc.) continues to form the basis for legislation in individual Member States for the control and management of AI.

[16] Council Directive 92/40/EEC of 19 May 1992 introducing Community measures for the control of Avian Influenza
[17] Council Directive 2005/94/EC on Community measures for the control of Avian Influenza and repealing Directive 92/40/EEC

The Directive is an extensive and comprehensive document running to some 50 pages, containing 69 Articles and a further 10 annexes. The main themes are:

- Preventative measures relating to surveillance and early detection of disease;
- Increasing level of awareness and preparedness of both the competent authority and farming community;
- Minimum control measures in the event of an outbreak and early detection of spread;
- Other 'subsidiary' measures to avoid spread to other species;
- Vaccination of poultry.

Whilst the measures contained are highly prescriptive, there are some derogations provided throughout the Directive allowing individual Member States to exercise risk-based judgements on a case-by-case basis *'proportionate to the health risk posed by different disease situations'.* The Directive makes clear distinction between 'Low Path' (LPAI) and 'High Path' (HPAI) disease, recognising that for Low Path *'control measures may differ from those that should apply in the case of highly pathogenic avian influenza, taking into account the different levels of risk posed by these two conditions'.*

The main issues covered by Directive 2005/94 in the key areas of surveillance, control measures and vaccination are summarised in Table 9 below:

Table 9 - Summary of Key Aspects of Notifiable Disease Control

Theme	Control Measures
Surveillance	• Surveillance programmes established by individual Member States, compulsory notification to competent authority of suspected outbreaks and notification to the Commission; • Epidemiological investigations; • Establishment of contingency plans by individual Member States; • Establishment of 'Reference' laboratories.
Control measures following a suspected outbreak	• Ban on all movements in and out of the suspected premises of birds, eggs, feed, manure and personnel (etc.) without the authorisation of the competent authority; • Housing of all poultry e.g. free range table chicken; • Provision for the establishment of a temporary control zone around the premises and subsequent control measures applied to holdings within that zone.

Theme	Control Measures
Control measures in the event of an outbreak	These depend to some extent on whether the competent authority considers the outbreak to be LPAI or HPAI and/or whether an outbreak has still to be classified. The following measures are specified however:- • Establishment of 'protection zone' (PZ) no less than 3km radius (1km in the case of LPAI) around the infected premises (IP) and a surveillance zone (SZ) no less than 10km radius; • Immediate slaughter of all poultry on the IP by an approved means. Provision for the slaughter of birds on holdings where LPAI; • Destruction of poultry meat and eggs derived from the IP *'within the probable date of introduction of the disease'*; • Destruction or treatment (under veterinary supervision) of all substances and waste likely to be contaminated with the virus e.g. feed, manure, litter etc. • Cleaning, disinfection and decontamination of buildings and equipment under official supervision. Destruction of anything that cannot be effectively decontaminated; • Restrictions of movements of all materials on and off poultry premises within the PZ and SZ without authorisation of the competent authority based on case-by-case risk assessments; • Implementation of additional biosecurity measures in PZ and SZ as directed by the competent authority;
	• Supervised disposal of infected poultry meat within poultry processing plants.
Vaccination	• There is a general prohibition within the Directive on the use of vaccination within EU territories, • Individual Member States are however permitted to use emergency vaccination to contain an outbreak of AI subject to a risk assessment by the competent authority and with prior approval by the Commission; • Member States are also permitted to introduce preventative vaccination, subject again to individual risk assessment and agreement by the Commission.

3.4 Environmental Controls

The Treaty on the Functioning of the European Union (Article 191(2) TFEU) sets out the important principle that 'the polluter pays'. Specifically, the Treaty states that:
'Policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Union. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay'.

Directive 2004/35/EC on environmental liability with regard to the prevention and remedying of environmental damage (ELD) establishes a framework based on the polluter pays principle to prevent and remedy environmental damage.
In effect, this places responsibilities on farmers and on other parts of the poultry meat supply chain which influence the ways in which work is undertaken.

3.4.1 Environmental Permitting

Directive 2010/75[18] on industrial emissions (formerly known as integrated pollution prevention and control or 'IPPC') applies to a wide range of different industrial and other activities. All poultry farms which exceed a threshold size of 40,000 bird places are within the scope of the legislation and its requirements. The same threshold number of birds applies to turkeys and ducks, as well as to chickens.

Other parts of the poultry supply chain, such as meat processing plants (carcass production capacity greater than 50 tonnes per day) and waste incineration plants are also within the scope of the legislation, as are other sectors which interact more indirectly, such as the energy and chemical industries.

The overall aim of the legislation is to prevent (or if that is not possible) to reduce emissions to air, water and land and to ensure that these, together with other environmental effects such as waste production are considered and regulated together.

Each farm with more than 40,000 bird places must apply for and receive its own 'permit to operate' prior to beginning production. Regulators set permit conditions in order to achieve a high level of protection for the environment as a whole. These conditions are based on the use of Best Available Techniques (BAT) which are defined as 'the most effective and advanced stage in the development of activities and their methods of operation'.

The Directive requires that Best Available Techniques are set out in a document which describes them and the associated emission levels of the relevant pollutants. For poultry (and pig) farms, this is provided by the current version of the BAT Reference Document for the intensive rearing of poultry and pigs[19] (Final Draft August 2015). This was prepared by a technical working group led by the European Commission. Operators are required to carry out activities in compliance with their permit.

The Directive does not specify any payments to be made by the operator to the regulator for obtaining and maintaining an environmental permit. This is a matter for decision at Member State level and it has therefore been addressed in the separate Member State section of this report.

3.4.2 Environmental Impact Assessment

New project and building developments which are likely to have 'significant effects' on the environment must prepare an environmental impact assessment (EIA) prior to their approval or authorisation. The process is intended to ensure that the environmental implications of proposals are fully considered before decisions are made. Consultation with the public and with relevant bodies in the particular Member State is a key feature of environmental impact assessment procedures.

[18] Directive 2010/75/EU of the European Parliament and of the Council on industrial emissions (integrated pollution prevention and control)
[19] http://eippcb.jrc.ec.europa.eu/reference/BREF/IRPP_Final_Draft_082015_bw.pdf

Directive 2011/92[20] sets out a list of projects which are considered as having significant effects on the environment and must therefore undertake a mandatory EIA. This list includes installations with more than 85,000 places for broilers although individual Member States may apply stricter threshold levels. Other activities that could be related to the poultry sector, such as waste disposal are also included. A second list of projects requires environmental impact assessments at the discretion of the Member States and these include other intensive livestock installations (i.e. not just those with over 85,000 broilers) and installations for the slaughter of animals.

The possible outcomes of the environmental impact process are approval, modification of plans (such as reduced scale of plans, additional mitigation) or refusal. The Directive does not specify payments to be made by the applicant to the regulator for planning permission, since this is also a matter for decision at Member State level.

3.4.3 Carcass Disposal

The disposal of poultry that die on the farm during the course of the normal production cycle is controlled by Regulation 1069/2009[21].

The definition of animal by-products in the legislation covers entire bodies and parts of animals (poultry) which are not intended for human consumption. The legislation is therefore also relevant to the disposal of slaughterhouse waste.

Within the legislation, animal by-products are categorised according to the level of risk to public and animal health arising from them. Category 2 material includes animals that died other than by being slaughtered or killed for human consumption and slaughtered poultry that have not successfully passed post mortem inspection. The category also includes animals killed for disease control purposes.

A number of possible disposal methods are set out for Category 2 material, including incineration. Incineration premises used for disposal of animal by-products must hold an appropriate environmental permit if equipment capacity exceeds 50 kg per hour. For lower capacity equipment, approval is required from the competent authority within the Member State.

In all cases, a key requirement is that incineration plants must be designed, equipped, built and operated in such a way that the gas resulting from the process is raised to a temperature of 8500C for at least 2 seconds.

High capacity plants (more than 50 kg per hour) must also have at least one auxiliary burner. This must be switched on automatically when the temperature falls below 850oC. It must also be used during plant start-up and shut-down operations to ensure that temperature is maintained during these operations. Low capacity incinerators, treating only animal by-products must also have an auxiliary burner.

Derived products from animal by-product disposal must in turn be disposed of via an approved method such as burial in an authorised land-fill site.

[20] Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment

[21] Regulation 1069/2009 of the European Parliament and of the Council laying down health rules as regards animal by-products and derived products not intended for human consumption

4. POULTRY FEED SUPPLY

The raw materials which can be used in compound feeds for poultry and the controls in place regarding manufacture and storage are important to farmers, to consumers and to intermediate parts of the supply chain.

It has been stated elsewhere in this report[22] that animals must be fed a wholesome diet which is appropriate to their age and species. This must maintain them in good health and satisfy their nutritional needs. Feed is the largest single contributor to the cost of poultry meat production on the farm (typically accounting for 60-70% of the total) and so the choice and cost of raw materials and the extent of associated controls have important economic implications.

From a consumer perspective, the feed supplied to poultry is one determinant of final product quality and it can influence purchasing behaviour, both positively and negatively. For this reason, certain requirements for animal feeds are also included within (human) food hygiene legislation[23]. This means that records must be kept in relation to the nature and origin of feed fed to animals and of veterinary medicines administered (see also Section 5).

The animal feed sector is highly regulated in the EU. A list of legislation on animal feedingstuffs (prepared as a working document in 2005 but still available on the Commission website)[24] extends to some 28 pages. The main areas of control can be summarised as follows:

- Raw materials and undesirable substances;
- Additives and medicated feeds;
- Manufacturing, hygiene and the approval and registration of feed compound premises;
- Sampling and analytical methods;
- Labelling of feeds.

This report concentrates on some specific aspects of feed legislation which are particularly relevant to the poultry meat sector and which are expected to form the basis of the comparison with the USA. These are set out below.

4.1 Salmonella Control and General Hygiene Measures

As stated in section 3.2.1, national control plans for Salmonella which are referred to in Regulation 2160/2003 are required to extend to feed production, as well as to primary production of animals and processing.

General hygiene requirements and obligations in the animal feed chain are set out in EC Regulation 183/2005[25]. This applies to virtually all feed businesses that make, use or market animal feed. 'Primary producers' such as livestock farms and arable farms that grow or sell crops for feed businesses are also included and a registration procedure is in place for all feed compounders, including small home-mix operations.

Article 6 of the Regulation requires all feed business operators to implement and maintain written procedures. These must be based on HACCP[26] principles which include identification of hazards and critical control points and the establishment of critical limits to separate what is acceptable from what is not. Article 20 encourages the development of good-practice guides for the feed sector and for the application of HACCP principles. In line with this, a manufacturer's guide has been prepared by FEFAC, the European Feed Manufacturer's Association[27].

[22] Council Directive 98/58 on the protection of animals kept for farming purposes, see section 3.1.1
[23] Requirements set out within Regulation 852/2004, see also Section 5
[24] http://ec.europa.eu/food/food/animalnutrition/legisl_v8-2005.pdf
[25] Regulation 183/2005 laying down requirements for feed hygiene
[26] Hazard Analysis and Critical Control Point (HACCP)
[27] http://www.fefac.eu/files/58224.pdf

4.2 Animal By-Products in Poultry Feeds

Regulation 1069/2009 (see also section 3.3) controls the extent to which animal by-products can be used in compound feeds for poultry. Unlike category 1 and 2 animal by-product material, category 3 (low-risk) material can be used in animal feeds but the legislation prohibits the feeding of animal protein derived from animals of the same species.
For poultry, this means that the use of processed fishmeal is permitted but other processed animal proteins (also known as PAPs) such as meat and bone meal are not allowed. Di-calcium phosphate and tri-calcium phosphate of animal origin are both permitted, subject to sourcing, processing and labelling requirements being met.

4.3 Genetically Modified Organisms in Poultry Feeds

Plant materials such as wheat, soya and maize are amongst the principle ingredients used within poultry feeds world-wide and there is continuing focus on the issue of genetic modified organisms (GMOs).

The EU feed industry imports the vast majority of its soya and maize requirements from third countries, including the USA as well as Brazil and Argentina. Supplies of these materials to the EU contain a (probably high) proportion of GM-derived products. It is not possible to quantify this as there is no legal requirement for importers to make declarations. Furthermore, identity preservation (i.e. the segregation of GM and non-GM crops after harvest and during transport, storage and subsequent use) is not routinely practiced.

Before a GMO can be marketed or grown in the EU, it must be authorised under Regulation 1829/2003[28]. This requirement applies both to living GMOs such as maize and soya, and to feed and food ingredients derived from the processing of GM crops. The authorisation procedure includes a safety assessment by EFSA[29] and this scientific advice is then taken into account by the Commission. Ultimately, it is for Member States to decide whether to allow the cultivation of GMOs and whether to allow the use of GMOs in animal feeds within their territories.

4.4 Additives and Medications in Poultry Feeds

Feed additives are products which may be used to improve the quality of poultry feed, the quality of food to consumers or to improve the animals' performance and health. Medicated feeds are those which contain a premix of veterinary medicines which require authorisation as veterinary medicine and a veterinary prescription.

Regulation 1831/03[30] sets out rules for the authorisation, supervision and labelling of additives in animal feeds. Feed additives may not be put on the market unless authorisation has been given following a scientific evaluation. This is undertaken by EFSA and it must demonstrate that the additive has no harmful effects on human and animal health or on the environment. Article 17 of the Regulation requires a publicly-available register of feed additives to be maintained[31].

Coccidiostats and histomonostats[32] are included as feed additives within Regulation 1831/03. Following a review in 2008, it was concluded that the regulatory framework was working properly in respect of these products[33]. However, the same Regulation resulted in an EU-wide ban of the final four antibiotics previously permitted for use as growth promoters in animal feeds. This ban took effect from the beginning of 2006 and means that no antibiotic health promoters which improve growth can be used for poultry within the EU.

[28] Regulation 1829/2003 on genetically modified food and feed
[29] EFSA is the European Food Safety Authority
[30] Regulation 1831/2003 on additives for use in animal nutrition
[31] http://ec.europa.eu/food/food/animalnutrition/feedadditives/docs/comm_register_feed_additives_1831-03.pdf
[32] These are chemically-produced by synthesis or by micro-organisms and used to prevent or control coccidiosis and worms (histomoniasis)
[33] Report from the Commission to the Council and the European Parliament on the use of coccidiostats and histomonostats as feed additives http://ec.europa.eu/food/food/animalnutrition/feedadditives/docs/Report-Coccs-233-2008-EN.pdf

A small number of veterinary products (include sulfamides) are still approved to treat coccidiosis outbreaks in poultry. The conditions for mixing veterinary medicine into feed, its marketing and use across the EU are currently set out in Directive 90/167[34]. This requires medicated pre-mixes to be authorised and for premises manufacturing medicated feedingstuffs to be approved by the competent national authority. Conditions are set out in the legislation regarding the format of the veterinary prescription itself and the duration of use. Responsibility for ensuring compliance with withdrawal periods is placed on the individual farm.

Proposals to revise current legislation (Directive 90/167) have recently been made in response to concerns about differences in implementation within the EU and because some provisions are not in line with recent developments. Current proposals aim (amongst other things) to increase the availability of veterinary medicinal products in future and to address the public health risk of antimicrobial resistance.

5. SLAUGHTER, PROCESSING AND MARKETING

This section focuses in particular on the animal-welfare related legislation that surrounds the slaughter of poultry and on relevant food hygiene requirements including the decontamination of carcasses after processing.

5.1 Stunning and Slaughter

EU controls on the killing of animals aim to minimise pain and suffering through the use of approved stunning methods, which are based on scientific knowledge and practical experience. The key current legislation is Council Regulation (EC) 1099/2009[35] which has applied to poultry as well as to other farmed animals since January 2013, and replaced previous legislation on the same subject.

Since it is a regulation, it must be implemented directly throughout all Member States. Furthermore, it requires slaughterhouses in third countries exporting meat to the EU to comply with similar standards. Member States however may set national rules which increase the protection provided to animals at the time of killing, if they wish.

The competent authority within the Member State is required to carry out inspections to verify compliance with the requirements of this legislation.

Amongst the key features of the Regulation are the following:

- An Animal Welfare Officer must be appointed, accountable for implementing animal welfare measures; there are also requirements for standard operating procedures and for evaluating the efficiency of stunning methods through animal-based indicators.
- Training for staff handling animals in slaughterhouses; in particular staff is required to possess a certificate of competence on welfare aspects of their tasks which is recognised by the competent authority of the Member State.
- New requirements for killing animals for disease control purposes in the event of highly contagious diseases such as avian influenza, particularly in relation to better planning, supervision and reporting. Use of methods which could be considered 'poor welfare' is allowed only under exceptional circumstances.
- The scope of stunning or killing methods is more strictly defined and minimum electrical parameters are provided.

[35] Council Regulation (EC) 1099/2009 on the protection of animals at the time of killing

The legislation sets out requirements for the layout, construction and equipment within slaughter houses. All lairage facilities must have suitable ventilation systems for good welfare, mechanical systems should have an alarm and emergency back-up. For water bath stunning, chickens must not be hung conscious on shackle lines for more than one minute (maximum of two minutes for turkeys and ducks). For gas stunning, the gas concentration must be measured continuously, displayed and recorded, together with the time of exposure. If gas concentrations fall below the required level, there should be an audible warning system.

5.1.1 Stunning Methods

Regulation 1099/2009 requires poultry to be killed only after stunning, in accordance with methods and requirements set out in an Annex. Exceptions are made within the legislation for religious slaughter (without stunning) but Member States may apply stricter rules and if they wish, may not allow exemptions for religious slaughter.

Methods of stunning are divided into mechanical, electrical, gas and others. Those most relevant to poultry are as follows:

- Maceration (mechanical method) which can be adopted for example where killing of male breeder stock (up to 72 hours old) is undertaken; it involves the immediate crushing of the entire chick.
- Water bath stunning (electrical method) which is used for the vast majority of chickens for meat in the EU at present. The Regulation prohibits the shackling of birds that are too small or injured and sets minimum electrical requirements for water bath stunning of chickens and turkeys as set out in Table 10 below:

Table 10 - Electrical Current Requirements (mA) according to Electrical Frequency (Hz)

Electrical Frequency (Hz)	Electrical Current (mA)	
	Chickens	Turkeys
Less than 200	100	250
From 200 to 400	150	400
From 400 to 1500	200	400

- Controlled atmosphere stunning (gas method) which includes a range of gas mixtures; it is currently used widely for chickens in the EU, although it is still less prevalent than electrical stunning.

The Regulation places a responsibility on business operators to take the necessary measures to ensure that poultry are protected from injury, that they do not show signs of avoidable pain or fear or exhibit abnormal behaviour and that they do not suffer from prolonged withdrawal of feed or water. The loss of consciousness following stunning must be maintained until the death of the animal. This should follow as quickly as possible e.g. by bleeding.

5.2 General Food Hygiene Requirements

Current EU food hygiene legislation, in place since January 2006, covers all stages of the production, processing, distribution and placing on the market of food intended for human consumption. In particular, EU legislation sets out the following principles:

- Food safety is ensured throughout the food chain, starting with primary production which includes the farm;
- Primary responsibility for food safety is borne by the food business operator;
- Implementation of procedures based on HACCP principles;
- Registration or approval systems, which include poultry slaughter houses and processing facilities.

General principles and requirements of food law are set out in Regulation 178/2002[36] which includes the precautionary principle and the principle of transparency. Regulation 852/2004[37] sets out general rules on food hygiene. These apply to all stages of production, processing and distribution of food and to export. Article 4 of this Regulation requires food business operators (FBOs) carrying out primary production (such as farmers) to comply with general hygiene provisions set out in Annex I to the regulations. FBOs carrying out food production, processing and distribution after the primary production stage must comply with the hygiene requirements set out in Annex II of the legislation.

Text in these annexes which is particularly relevant to the poultry meat sector is summarised in Table 11 below:

Table 11 - Key Food Hygiene Requirements within Annexes I and II of Regulation 852/2004

Reference	Key Requirements
Annex I	**General hygiene requirements for primary production and for the transport of live animals;** Food business operators must ensure that primary products are protected against contamination e.g. from veterinary medicine products and they must control hazards. This includes measures relating to animal health and welfare that have implications for human health; Facilities used in connection with primary production, to store and handle feed and equipment for transporting live birds must be kept clean and where necessary disinfected after use; Records must be kept of the nature and origin of feed fed to animals and of veterinary medicines administered, including the dates and withdrawal periods.

[36] Regulation (EC) 178/2002 of the European Parliament and of the Council laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food law

[37] Regulation (EC) 852/2004 of the European Parliament and of the Council on the hygiene of foodstuffs

Reference	Key Requirements
Annex II	**General hygiene requirements for food premises and for rooms where food is prepared, treated or processed;** Food premises must be kept clean and maintained in good repair and condition; Requirements are set out in relation to layout, design, construction, siting and size; Additional and specific requirements are set out for rooms where foodstuffs are prepared, treated or processed; Vehicles and containers used for transporting foodstuffs are to be kept clean and maintained in good repair and condition to protect foodstuffs from contamination and are, where necessary, to be designed and constructed to permit adequate cleaning and/or disinfection; All equipment with which food comes into contact is to be effectively cleaned and, where necessary, disinfected. Cleaning and disinfection are to take place at a frequency sufficient to avoid any risk of contamination; Every person working in a food-handling area is to maintain a high degree of personal cleanliness and to wear suitable, clean and, where necessary, protective clothing; Food business operators are to ensure that food handlers are supervised and instructed and/or trained in food hygiene matters commensurate with their work activity.

Regulation 853/2004[38] sets out specific hygiene rules for food of animal origin. It requires most establishments that handle products of animal origin (but not farms or transport operators) to be registered or approved and a list of approved premises is available on the European Commission website[39].

The Regulation also sets out specific hygiene requirements for meat from poultry and key provisions are set out in Table 12 below.

Table 12 - Specific Hygiene Rules set out in Regulation 853/2004

Activity	Key Requirements
Transport to slaughterhouse	• Animals must be handled carefully without causing distress; • Animals from flocks known to be contaminated with agents of public-health importance can only be transported to the slaughterhouse when permitted by the competent authority; • Crates and modules must be easy to clean and disinfect, prior to re-use equipment must be cleaned, washed and disinfected.

[38] Regulation (EC) 853/2004 of the European Parliament and of the Council laying down specific hygiene rules for on the hygiene of foodstuffs

[39] http://ec.europa.eu/food/food/biosafety/establishments/index_en.htm

Activity	Key Requirements
Requirements for slaughterhouses	Slaughter house construction, layout and equipment must meet the following: • There must be a room or covered space to receive and inspect animals before slaughter; • Separate room for evisceration and further dressing (unless separation by time has been allowed); • Separation in space or time of i) stunning and bleeding ii) plucking and any scalding and iii) dispatching meat; • No contact between meat and walls, floors and fixtures; • Slaughter lines designed for constant progress, adequate separation of different lines; • Facilities for disinfecting tools with hot water supplied at not less than 82°C (or equivalent); • Separate facilities for cleaning, washing and disinfection of transport equipment.
Requirements for cutting plants	Cutting plants must: • Be constructed to avoid meat contamination; • Have rooms for separate storage of packaged and exposed meat; • Have facilities for disinfecting tools with hot water supplied at not less than 82°C (or equivalent).
Slaughter hygiene	• Ante-mortem and post-mortem inspection must be carried out as instructed by the competent authority; • Animals must be slaughtered without undue delay; • Stunning, bleeding, evisceration and other operations must be carried out in such a way that contamination of the meat is avoided; • After evisceration, carcasses must be chilled to not more than 4°C as soon as possible; • If immersion chilling is undertaken, every precaution must be taken to avoid contamination of carcasses and equipment must be emptied, cleaned and disinfected at least daily; • Animals for slaughter for disease eradication and other sick animals must only be slaughtered in the establishment if permitted by the competent authority and this must be performed under official supervision.
Hygiene during and after cutting and boning	• Meat intended for cutting is brought in progressively, as needed; • The temperature of the meat must be maintained at not more than 4°C by means of an ambient temperature of 12°C (or an equivalent system) unless it is transferred directly from the slaughter premises.

Activity	Key Requirements
Slaughter on the farm	• On-farm slaughter can only be done with the authorisation of the competent authority; • The farm must undergo regular veterinary inspection; • Suitable facilities are required for ante-mortem inspection, hygienic slaughter and further handling of birds; • Animal welfare requirements must be complied with; • Slaughtered birds must be accompanied to the slaughter house by a declaration by the FBO (indicating veterinary products used and date and time of slaughter) and a certificate from an approved veterinarian.

Regulation 854/2004[40] sets out rules for organising official checks on food intended for human consumption. These include approval of premises and the need for audits of good hygiene practice. For fresh meat premises such as poultry processing plants, an official veterinarian must carry out specific checks both before and after animals are killed.

5.3 Carcass Decontamination

Article 3(2) of Regulation 853/2004 states that food business operators shall not use any substance other than potable or clean water to remove surface contamination from products of animal origin, unless use of the substance has been approved as referred to elsewhere in the same document[41]. Whilst this provides a legal basis to permit the use of an alternative substance, at present for poultry no decontamination treatments are authorised in the EU.

EFSA has provided scientific opinions on the safety and effectiveness of a number of de-contamination substances, particularly those intended for use on poultry carcasses. In 2015, an EFSA report[42] provided an insight into the EU stance and potential concerns as follows:

> '*For many decades the use of substances other than potable water, i.e. antimicrobial substances, has been resisted, because they would mask unhygienic slaughter or processing practices and would certainly not be an incentive for businesses to implement hygienic practices. If permitted for use, it was also feared that their widespread use coupled with high bacterial counts due to unhygienic practices, would induce resistance of the micro flora present on the surface of the treated products*'.

5.4 Poultry Meat Marketing

Regulation 543/2008[43] implements the marketing standards for poultry, initially laid down in Regulation 1234/2007. The legislation sets out the terms that can be used to indicate the farming system used (e.g. free range) and provides definitions for various different poultry cuts.

[40] Regulation (EC) 854/2004 on the organisation of official checks on products of animal origin intended for human consumption
[41] This is covered in Article 12(2) of Regulation 853/2004
[42] The EFSA Journal (2005) 297, 1-27 The treatment of poultry carcasses with chlorine dioxide, acidified sodium chlorite, trisodium phosphate and peroxyacids
[43] Commission Regulation (EC) 543/2008 laying down detailed rules for the application of Council Regulation (EC) 1234/2007 as regards the marketing standards for poultrymeat

Poultry carcasses and cuts are graded as A or B according to confirmation and appearance and definitions are provided for these within the regulations. Class A carcasses and poultry cuts must be free from dirt or blood and free of foreign smell and protruding broken bones. Sampling criteria are set out, based on the size of the batch and the number of defects that can be tolerated.

Microbiological criteria for foods including poultry are set in Regulation 2073/2005[44]. For poultry carcasses (chicken and turkey), Salmonella must be absent in neck skin samples after chilling. In the event of unsatisfactory results, improvements are required which may concentrate on slaughter hygiene, processing controls and / or farm practices. A possible change to this legislation is currently under consideration which would also establish process hygiene criteria for Campylobacter. This would ensure that corrective action is taken when the level of contamination exceeds a certain limit.

Regulation 1337/2013[45] relates to legislation on food information to consumers (Regulation 1169/2011). It requires the indication of country of origin (Member State or third country) on the label of fresh, chilled and frozen poultry meat. It also requires traceability, such that there is a link between the meat and the group of animals from which it has been obtained.

For fresh poultry meat, Regulation 543/2008 specifies the inclusion of a 'use-by' date and for pre-packaged poultry meat, it states that the registered number of the slaughter house or cutting plant or the country of origin for third countries must be shown[46].

For frozen poultry, the legislation requires a temperature of -12oC or lower to be maintained (with brief fluctuations of no more than 30C). For fresh produce, permitted methods of chilling are air-chilled, air-spray chilled and immersion-chilled.

The method and frequency of checks on water absorption by carcasses during processing operations is set out. The increase in weight must not exceed 4.5% for immersion chilling or 2.0% for air-spray chilling. No increase is allowed for air-chilling. Separate sampling and testing is required for frozen products and random checks can also be made by the Member State that receives such products. The results of product checks undertaken must be provided by the competent authorities to the national reference laboratory within the relevant country.

For poultry cuts (e.g. breast, breast fillet), the total water content must be assessed on samples using a specified chemical test, based on the water and nitrogen (protein) content. A water-to-protein ratio is calculated and the highest figures permitted for chicken breast fillet (no skin) and chicken breast (with skin) are set out in Table 13 below.

Table 13 - Maximum Permitted Water to Protein Ratio for Chicken Cuts

	Air chilled	Air-spray chilled	Immersion-chilled
Chicken breast fillet (no skin)	3.40	3.40	3.40
Chicken breast (with skin)	3.30	3.50	3.60

In addition to whole carcasses and cuts, the EU also has animal health rules that cover the importation and trade of meat-based 'preparations' and 'products'.

[44] Commission Regulation (EC) 2073/2005 on microbiological criteria for foodstuffs

[45] Commission Implementing Regulation (EU) 1337/2013 laying down rules for the application of Regulation (EU) 1169/2011 of the European Parliament and of the council as regards the indication of the country of origin or place of provenance for fresh, chilled and frozen meat of swine, sheep, goats and poultry

[46] Note that poultry meat marketing standards (Council Regulation 1047/2009) state that 'fresh poultrymeat' must not have been stiffened at any time by the cooling process. Hygiene rules for food of animal origin (Regulation 853/2004) state that 'fresh meat' means meat that has not undergone any preserving process other than chilling, freezing or quick freezing.

Meat preparations are defined in Regulation (EC) No 853/2004 as 'meat that has foodstuffs, seasonings or additives added to it or which has undergone a treatment that is insufficient to modify the cellular structure of the meat and thus to cause the characteristics of the fresh meat to disappear'.

Such preparations traded or imported into the EU must be produced using fresh meat that conforms to the relevant animal and public health conditions laid down in other legislation.

Meat products are defined as 'processed products resulting from the processing of meat or from the further processing of such processed products, so that the cut surface shows that the product no longer has the characteristics of fresh meat'.

Imports to the EU can come only from a third country that is listed in Commission Regulation (EC) No 798/2008, indicating that the country has been verified as having fulfilled all the basic animal and public health requirements for the importation of fresh poultry meat. This includes reference to notifiable diseases such as Avian Influenza within the third country and the existence of suitable disease surveillance programmes.

6. REQUIREMENTS IN SELECTED EU MEMBER STATES

Elsewhere in this document, reference is made to Member States being able to adopt legislation and practices in their own territories which exceed European Union requirements. A summary of the ways in which requirements have been adopted or added-to is set out in tabular form below for Germany, France and Poland.

6.1 Summary of Requirements in Germany

These are set out in Table 14 below.

Table 14 - Summary of National Requirements in Germany in Comparison to EU

Requirement	Summary for Germany
Stocking density for chickens	Legislation limits liveweight to 39 kg /m^2 in Germany (EU maximum of 42 kg is not permitted) but a lower maximum of 35 kg /m^2 applies to chickens up to 1600 grams (based on an average of three consecutive growing periods). A recently-introduced voluntary scheme in Germany (which applies to most retail sales) now limits all production to 35 kg of liveweight /m^2.
Stocking density for turkeys	Turkey farmers have an agreement with the government, retailers, animal welfare organisations and NGOs which has a monitoring program based on welfare indicators. Slaughter house data are also used. Under this scheme, the maximum permitted stocking densities are 52 kg of liveweight/m^2 for hens and 58 kg of liveweight/m^2 for stags. For turkey farmers that are not part of the scheme, the stocking densities are lower i.e. 45 kg of liveweight/m^2 for hens and 50 kg of liveweight/m^2 for stags.

Requirement	Summary for Germany
Stocking density for ducks	Duck production is comparatively small-scale in Germany and requirements may vary between Federal States. Housing requirements are currently being considered particularly in relation to water provision.
Outdoor poultry meat production	Small-scale in Germany and mainly to organic production standards. Conventional production is undertaken to EU legislation standards.
Other animal welfare requirements	All new buildings have to include windows equivalent in surface area to at least 3% of the total floor area. This exceeds the requirements of EU legislation. Light patterns are the same as those set out in the Broiler Directive. Maximum ammonia and carbon dioxide levels are also the same as those set out in Annex II of the Directive, but these apply to all chicken flocks in Germany and not just to those operating at higher stocking densities.
Environmental permitting	An environmental permit is required for all poultry units with at least 40,000 places (same as EU). The fee for environmental permitting is part of the general building permission which has to be paid for a new poultry unit. The fee is payable only once and the cost is set by each Federal State. It is usually based on a percentage of the total cost of the new unit.
Disposal of fallen stock	Fallen stock has to be sent to a specific rendering plant. Each Federal State has its own plant and farmers are only allowed to send fallen stock to their assigned plant. The use of on-farm disposal of fallen stock (e.g. using small-scale incineration as permitted in EU Animal By-Products legislation) is not allowed.
Notifiable diseases	Notification is the same as EU requirements. Each farm in Germany is insured against notifiable disease. Farmers pay a compulsory fee and in the event of a disease outbreak, a compensation payment is made comprising money from the federal state and from the government. Some specific insurance policies also assist with the costs of cleaning and disinfection.
Flock testing requirements	Same as EU for *Salmonella*. No compulsory testing for *Campylobacter* but voluntary programmes are in place at slaughter houses.

Requirement	Summary for Germany
Assurance schemes	The German Animal Welfare Association adopts standards (Tierschutzlabel) which exceed EU legislation, both on-farm and at transport and slaughter. Stage 1 requirements include a maximum stocking density of 25 kg of liveweight/m^2 and a maximum flock size of 30,000 hens; stage 2 has a maximum stocking density of 21 kg of liveweight per m^2 and a maximum flock size of 16,000 hens. Additional requirements include slow growing strains, maximum transport time of 4 hours and the provision of perches and pecking objects. The 'Animal Welfare Initiative' is a national scheme which involves poultry producers, processors and retailers. The main requirements are manipulable materials and a maximum density (broiler 35 km/m^2, turkey hens 48 km/m^2 and turkey stags 53 km/m^2. A quality and safety (QS) inspection scheme is in place which covers all production stages, from farm to retail outlet. Whilst this is voluntary, it is widely-required by customers and thus it is thought that over 98% of farmers are members of the scheme.
Feed	Requirements are the same as for the EU.
Transport	Transport requirements for poultry in Germany exceed EU legislation in some aspects. For example, a minimum of 170cm^2/kg is required for transport of birds between 1.6kg and 2kg liveweight in Germany (compared to 160cm^2 in EU legislation). Furthermore, 130cm^2/kg is required for 4kg birds (compared to 115cm^2 in EU legislation). National legislation in Germany also specifies a minimum crate height, based on the average liveweight of the birds. For instance, a minimum height of 23cm is required for birds up to 3kg, whilst at least 25cm in height is required for birds up to 5kg.
Slaughter	A general flock health inspection takes place on the farm just prior to depopulation. Government officials inspect every farm on the day before the birds are depopulated (both at thinning and final depopulation) and examine farm records for mortality, medication use etc. On arrival at the slaughter house, random samples of birds are also inspected. Legislation requires birds to be given water within two hours of arrival at the slaughter plant. Since this is considered impractical, this therefore sets the maximum holding time within the lairage. All animals (no exceptions) have to be stunned prior to killing and this also applies to on-farm culling of sick / injured birds. These requirements exceed EU standards.

Requirement	Summary for Germany
	The majority of the systems use gas stunning (approximately 80% of the birds) with mainly smaller plants using water baths. Killing is by automatic neck-cutters. Traceability, carcass treatments and food safety requirements are in line with EU legislation.
Enforcement & compliance	Enforcement of legislation is carried out by government officials; usually one visit per year is made to farms. Private schemes are enforced by their own inspectors and funded by industry. Inspections for the QS scheme are risk-based but typically take place approximately twice annually.

6.2 Summary of Requirements in France

These are set out in Table 15 below

Table 15 - Summary of National Requirements in France in Comparison to EU

Requirement	Summary for France
Stocking density for chickens	Same as EU, the maximum of 42kg/m^2 can be used subject to the criteria set out in the Broiler Directive being met.
Stocking density for turkeys	The stocking density for turkeys is generally to a maximum of 55 kg of liveweight/ m^2 but this can be increased to 58 kg if a derogation is given. This requires air quality surveys and house environment data to be completed. These limits are understood to be recommendations rather than specific legislation. It is noted that in France, the only known antibiotic treatment for blackhead does not have market authorisation for use in turkeys in France, thus this condition cannot be treated at present.
Stocking density for ducks	The stocking density for ducks is generally to a maximum of 50 kg of liveweight/m^2 but this can be increased to 55 kg if a derogation is given. Again, this requires air quality surveys and house environment data have to be completed. As above, these limits are understood to be recommendations rather than specific legislation.
Outdoor poultry meat production	Outdoor chicken production is important at retail level in France, accounting for some 65% of all whole bird production (including organic). Standard outdoor production in France is to EU requirements but 'Label Rouge' production (approximately 2 million birds per week) operates to more stringent standards.

Requirement	Summary for France
Other animal welfare requirements	Same as EU requirements for ammonia, carbon dioxide and lighting.
Environmental permitting	For all new poultry units with over 30,000 birds, a specific impact study is required and so the threshold for this is lower (i.e. more stringent) in France than it is for EU legislation. The study must describe the impact that this would have on the environment and on water, soils etc. The farmer would normally commission a consultant to undertake this work. For flocks of over 40,000 birds, EU legislation on environmental permitting applies. It is understood that no direct payments are required from farmers to the authorities in respect of permitting, although fees for permits are paid by poultry meat processors.
Disposal of fallen stock	Fallen stock has to be sent to a rendering plant. The use of on-farm disposal of fallen stock (e.g. using small-scale incineration as permitted in EU Animal By-Products legislation) is not allowed.
Notifiable diseases	Notification procedures are *as per* EU requirements. In the event of a notifiable disease, the outbreak farm receives compensation from the government but neighbouring farms (whose flocks are slaughtered as a precaution) do not. For instances where there is no government payment, farmers may receive compensation from a mutual fund set up with other farmers, as part of a group.
Flock testing requirements	*For Salmonella*, there is specific legislation in place for breeder flocks *(S. enteritidis and S. typhimurium)* and if detected, the flock has to be slaughtered as per EU legislation. Likewise, every meat flock has to be tested for *Salmonella* before slaughter. If thinning is undertaken, flocks have to be tested more than once and the costs are borne by the farmer. If a flock tests positive, it can still be slaughtered but this has to be followed immediately by completion of sanitation measures (this normally takes place at the end of the day). There are no statutory requirements for *Campylobacter* testing.
Litter use & disposal	Litter must be replaced for each new flock (it cannot be re-used). It cannot be burnt after use and it is understood that it is not used in anaerobic digestion. In practice, litter is either land-spread or composted prior to spreading.

Requirement	Summary for France
Assurance schemes	The Label Rouge scheme is widely adopted for outdoor poultry production, including organic systems. Where Label Rouge is not followed, both conventional and organic production is mainly to legislation standards.
Feed	Generally the same as EU requirements but animal protein and animal fat (permitted in legislation) may not be used due to retail specifications. This is considered to have more impact on turkey production than for chicken. In practice, there is little or no use of animal-origin materials at all (including fish meal) because of the need to use separate production lines or ensure thorough cleaning prior to the manufacture of 100% vegetable diets.
Transport	The requirements are generally the same as EU legislation. Drivers have to hold a specific certificate on animal welfare requirements and to obtain this, a two day training course has to be attended every five years.
Slaughter	Live bird inspection takes place at the slaughter house with no official farm visit prior to slaughter. This is carried out by slaughter house staff under the supervision of an official vet. Specific training is required for slaughter house staff every five years. Stunning is mainly undertaken in water baths, with only an estimated 10% of all chicken and turkey throughput being gas-stunned. Traceability, carcass treatments and food safety requirements in France are in line with EU legislation.
Enforcement & compliance	Enforcement of the legislation is carried out by government officials; usually one visit per year which assesses all farming enterprises. Failure to achieve the required standards can result in loss of farm payments and so it is thought that the rate of compliance is high. Assurance scheme visits are typically carried out twice annually.

6.3 Summary of Requirements in Poland

These are set out in Table 16 below.

Table 16 - Summary of National Requirements in Poland in Comparison to EU

Requirement	Summary for Poland
Stocking density for chickens	Same as EU, in those stocking densities of 33, 39 and 42 kg / m^2 can be used subject to meeting criteria on house design, documentation and environmental monitoring.
Stocking density for ducks	This is determined on the basis of an Ordinance of the Minister of Agriculture and Rural Development which limits the stocking density for ducks to 19 kg per m^2.
Outdoor poultry meat production	When undertaken, production follows EU legislation requirements.
Other animal welfare requirements	None which exceed EU requirements.
Environmental permitting	The EU threshold of 40,000 bird places applies. Payment is required for permits for agricultural production, equivalent at present to around €115. Within this, farmers must develop appropriate management systems, control emissions and nuisance and prepare plans for storage and utilisation of wastes. Approval for this must be obtained from the District Chemical-Agricultural Station.
Disposal of fallen stock	Approved on-farm and off-farm methods are allowed as per EU Animal By-Products legislation.
Notifiable diseases	EU legislative requirements apply and compensation is paid from the state budget for animals that die or are killed within the measures taken to combat disease spread. Compensation is also paid for products or animal origin such as eggs and feed and equipment which cannot be disinfected and must therefore be destroyed.
Flock testing requirements	National *Salmonella* control programmes for poultry are in place as per EU legislation. Monitoring programmes are in place for avian influenza in poultry and in wild birds. There is no compulsory testing for *Campylobacter*.

Requirement	Summary for Poland
Feed	Requirements are the same as for the EU but it is noted that an official monitoring programme for residues of antibiotics in water (in addition to feed) is in place in Poland, with 4,000 samples to be collected in 2016.
Transport	Transport times and space allowances are the same as in EU legislation. Training for drivers and other staff (as required in EU legislation) and costs the equivalent of around €80.
Slaughter	Requirements are generally the same as in EU legislation and ritual slaughter is allowed. Stunning is normally carried out in a water bath. Official guidelines and instructions for regional veterinary authorities have been issued by the Chief Veterinary Officer in order to harmonise control activities throughout Poland.
Enforcement & compliance	Pre-slaughter, live bird inspection takes place on the farm. The costs of inspection are borne by the flock owner with the fees regulated by domestic law and based on time and travel costs. Fees begin at around €5 for up to 1,000 birds and this is increased by between €1-2 for every additional 1,000 birds. The costs of inspection at the slaughter house are borne by the operator as part of the overall costs of veterinary activities undertaken by official veterinarians. Fees generally fall between €10-35 per 1,000 birds.

APPENDIX 2

POULTRY MEAT REGULATORY FRAMEWORK AND PRACTICES IN THE USA

1. POULTRY MEAT PRODUCTION AND CONSUMPTION IN THE USA

In 2015, the USA produced some 8.69 billion (8,690 million) broilers,[47] making it the largest chicken producing country in the world. Total chicken and turkey meat production combined amounted to the equivalent of over 27 million metric tonnes in 2015 as shown in Table 1[48]. Of this, chicken production accounted for 24.2 million tonnes (88%), with turkey meat at 3.2 million tonnes (12%). In the USA, duck production is limited and it is not included in government-tracked poultry production data.

According to a USDA Report[49], the production of poultry is expected to rise from 2015 to 2025 as per capita consumption of beef and pork is projected to decline. Table 1 also shows that there have been some small changes in USA per capita consumption of poultry meat in recent years[50] but with the exception of the figure for 2015, little overall growth.

Table 1 - Total Poultry Meat Output and Consumption in USA, 2010 to 2015

	Total Poultry Meat Carcass weight (million metric tonnes) for chicken and turkey	Index (total weight trend)	USA per capita consumption of poultry meat (converted to kg)
2010	25.54	100	45.4
2011	26.04	102	45.5
2012	25.95	103	44.3
2013	26.31	103	45.0
2014	26.58	104	45.5
2015	27.40	107	48.1

In 2014, Georgia was the largest poultry-producing state in the USA with an output of 1.3 billion meat chickens, equivalent to around 3.1 million metric tonnes. In the same year, Alabama produced just over 1 billion meat chickens, equivalent to some 2.5 million tonnes. Arkansas ranked third in chicken meat production in the USA, also producing just over 1 billion chickens and accounting for close to 2.5 million tonnes. In total, these three states represent around one-third of USA chicken meat output.

[47] Data from the USDA National Agricultural Statistics Service
[48] The National Agricultural Statistics Service (www.nass.usda.gov) reports production in pounds (lb) and this has been converted to metric tonnes
[49] USDA Long-Term Projections Report OCE-2015-1, February 2015.
[50] UBased on statistics from the National Agricultural Statistics Service.

According to the National Chicken Council,[51] the USA broiler industry exported 19.1% of its total chicken production in 2014, although provisional data for 2015 suggest a small reduction to 16.0%. It is understood that dark meat (i.e. leg quarters and back portions) represents the majority of this, because North American consumers prefer breast meat. Thus exports are an important component in balancing chicken meat supply and demand.

In recent years, the importance of poultry meat exports from the USA has increased since (with the exception of 2015) home consumption levels have been fairly static. A recent report[52] has shown that between 1994 and 2013, broiler exports from the USA increased at an annual rate of 5.5% (from 1,307 to 3,632 million metric tonnes) whilst over the same period, turkey exports increased annually by an average of 5.4% (from 127,187 to 344,346 million metric tonnes). The same report noted the lack of exports to the EU and this was attributed to the USA's use of 'chlorine as a post-slaughter pathogen-reduction treatment on raw poultry carcasses'. It estimated that the EU-28 market for USA poultry could approach $600 million annually, if access could be gained to this market.

In 2015, the largest poultry meat export markets (by value) for USA were Mexico, Canada and Hong Kong whilst Angola, Cuba and China were also significant. The importance of Russia as an importer of poultry meat has reduced in recent years, due to a combination of increased home production, cuts in tariff-rate quotas and reprisals following economic sanctions imposed on Russia in 2014.

2. THE USA REGULATORY APPROACH

The USA regulatory approach is based on the United States Constitution which is the supreme law and the basis for federal (national) legislation. The Constitution also sets out the rights and responsibilities of the states in relation to federal government. In practice, there are two levels of regulation in the USA, namely the federal and the state:

- Federal law applies to the whole of the USA;
- State law takes effect within a particular state and it can be introduced in situations where no federal legislation exists.

In the event of a dispute or conflict between federal and state requirements, federal law prevails due to the 'supremacy clause', which is part of the Constitution. The clause contains the doctrine of pre-emption, which establishes that the federal constitution and federal law generally, take precedence over state laws.

Within the livestock sector, regulation and guidelines are provided by various departments of government including Agriculture, Homeland Security, Labour, Commerce, Health and Human Services, Transportation and the Environmental Protection Agency. Each has authority over a particular aspect of regulation or guidance which is relevant to the livestock sector in the USA. Those bodies which are most relevant to the technical issues covered within this report are outlined below.

[51] US Broiler Exports Quantity and Share of Production www.chickencouncil.org
[52] Factors influencing US Poultry Exports by Renan Zhuang and Toby Moore; International Food and Agribusiness Management Review Volume 18 Special Issue A, 2015

2.1 The Department of Agriculture (USDA)

The United States Department of Agriculture (the USDA) is responsible at national level for formulating policy on farming, food and natural resources and for maintaining food safety. The stated aims of the USDA include expanding economic opportunity through innovation and preserving natural resources. It also has a domestic and international role in reducing the effects of avian influenza on both agriculture and public health and controlling its spread. The USDA's objectives are accomplished through some 17 different agencies and other offices, including the following:

- The Food Safety Inspection Service (FSIS), which is the body charged with enforcement work and for ensuring that meat, poultry and egg products are safe, wholesome and correctly labelled and packaged. Relevant prevailing legislation enforced by FSIS includes the Federal Meat Inspection Act and the Poultry Products Inspection Act.

- The Agricultural Marketing Service, which facilitates domestic and international sales of USA agricultural products, through a range of activities including the development of quality grade standards for agricultural commodities and administering marketing regulatory programs. For poultry meat, the USDA grade program, regulations and shields are intended to establish a basis for quality and facilitate marketing. The Agricultural Marketing Service has also been responsible for regulating Country of Origin labelling for a range of different foods.

- The Animal and Plant Health Inspection Service, whose responsibilities include protecting and promoting the health and care of animals and reporting on confirmed cases of avian influenza in poultry. The Service is also responsible for the administration of the Animal Welfare Act.

- The Foreign Agricultural Service, which is responsible for global supply and demand information and for seeking market opportunities for the USA. It seeks improved market access for USA products and administers export financing and market development programs.

- The Natural Resources Conservation Service, which is the main federal agency that works with private landowners to help them conserve, maintain and improve their natural resources.

- The Grain Inspection, Packers and Stockyards Administration (GIPSA), which facilitates the marketing of poultry and other products and promotes fair and competitive trading practices for the benefit of consumers and producers.

2.2 The Food and Drug Administration

The Food and Drug Administration (FDA) which is part of the Department of Health and Human Services has a role in establishing food safety legislation and a responsibility for protecting public health, for example by assuring the safety and efficacy of veterinary drugs.
The FDA produces regulatory and other guidance on a range of different topics, including antimicrobial resistance and good manufacturing practices. However these do not create or confer any rights and they are not binding. It follows therefore that an alternative approach to that set out in FDA guidance can be used, if it satisfies the requirements of applicable statutes and regulations.

2.3 The Environmental Protection Agency

The Environmental Protection Agency (EPA) of the federal government has a primary responsibility for protecting human health and the environment. The EPA has a network of 10 regional offices within the USA, each of which is responsible for carrying out the Agency's programs within specific states. On some issues, the EPA sets national standards that states must enforce through their own regulations.

2.4 Enforcement of Legislation in USA

Each of the bodies above has a role in the enforcement of legislation in the USA. For example, the USDA is responsible for enforcement of the Animal Welfare Act and the FDA is involved in enforcement of food safety legislation. The EPA enforces federal legislation such as the Clean Water Act and can take civil or criminal enforcement action against violators of environmental law.

At state level, general law enforcement duties are the responsibility of government bodies within that particular state.

3. PRODUCTION SYSTEMS – USA REGULATION

This section focuses on USA legislation on animal welfare on the farm and during transport, animal health and environmental controls that affect the poultry meat sector.

3.1 On-Farm Animal Welfare

Both regulatory and non-regulatory controls are summarised here.

3.1.1 Regulatory Controls

Animal welfare regulations are controlled primarily by the US Department of Agriculture, but at present there are no federal regulations to control the welfare of animals used in agriculture. Whilst there is an Animal Welfare Act[53] which dates back to 1966 (with subsequent amendments up to 1990), animals on the farm which are used for food, fibre or for other agricultural purposes are excluded from the scope.

[53] https://www.nal.usda.gov/awic/animal-welfare-act

The treatment of farm animals may however be controlled through state laws. Legislation has been passed in certain states which controls specific aspects of farm animal welfare. For example, a small number of states prohibit the use of conventional cages for laying hens and the force-feeding of birds for foie gras. To date however, such legislation is understood to be largely confined to states with comparatively small numbers of commercial farming operations. There is currently no prevailing state legislation on farm animal welfare in the three largest poultry meat producing states which are considered here (Georgia, Alabama and Arkansas).

It follows therefore that the maximum stocking density for chickens and turkeys on the farm is not set in legislation in the USA. Rather, it is determined by best management practices and controlled through guidelines established by trade associations and customers. These guidelines are developed in conjunction with both industry personnel and the scientific community.

3.1.2 Non-Regulatory Controls

Guidelines on the welfare of chickens, published by the National Chicken Council[54] are almost universally adopted by producers on a voluntary basis (the National Turkey Federation provides equivalent guidance for turkey production). These guidelines cover all parts of the bird's life and extend to hatchery operations, catching, transport and processing. Audit checklists are provided for use and these can be completed by company or independent auditors to check compliance.

The NCC programme does set out requirements for stocking density of chickens. Maximum stocking density rates are specified in terms of 'pounds (liveweight) per square foot' of growing area, with different rates according to the average liveweight of the birds. A higher maximum stocking density – in terms of liveweight per unit area - is permitted as bird liveweight increases.

For chickens between 4.5 and 5.5lb (2.0 to 2.5kg), the maximum stocking density is stated as 7.5lb per square foot. After conversion, it is calculated that this is equivalent to between 36 and 37kg liveweight per m2. Full details of stocking density requirements for chickens, as set out in the NCC programme with metric equivalents (kg/m2) are set out in Table 2.

Table 2 - Maximum Stocking Density within the National Chicken Council Animal Welfare Programme with Metric Conversion

Maximum Bird Liveweight Range		Maximum Stocking Density	
As stated in pounds (lb)	Metric conversion (kg)	As stated in pounds per square foot	Metric conversion (kg per square metre)
Below 4.5	Below 2.04	6.5	31.7
4.5 to 5.5	2.04 to 2.49	7.5	36.6
5.6 to 7.5	2.54 to 3.40	8.5	41.5
More than 7.5	More than 3.40	9.0	43.9

The same programme requires a minimum of four hours darkness in each 24 hours for chickens, except for the first week and the last week of production. The dark period may be provided in increments of one, two or four hours. During the light hours, light intensity must be equivalent to around 5 lux[55].

[54] http://www.nationalchickencouncil.org/wp-content/uploads/2015/08/NCC-Guidelines-Broilers-August2015.pdf
[55] The NCC Programme states light intensity of at least half a foot-candle at bird height. This has been converted to lux, based on one foot-candle being equivalent to 10.7 lux

The widespread adoption of the NCC program by producers in the USA is partly driven by customer requirements. Compliance with the program is scrutinised through the audit process. It is understood that the contractual arrangements in place between farmers and other parts of the supply chain are also used to ensure compliance. Contracts typically require company guidelines to be adhered to at all times, otherwise termination of the agreement is possible. Since farmers are dependent upon contracts and the income received for marketing purposes and to repay the capital costs of buildings and equipment, this acts as a powerful incentive.

3.2 Animal Welfare during Transport

The only federal legislation on transportation times for animals is the so-called 'Twenty Eight Hour Law'[56]. This was first enacted in 1873 although it has since been amended, most recently in 1994. It states that animals (including those used for food) cannot be transported for more than 28 consecutive hours without being unloaded for five hours for rest, water and food. Time spent in loading and unloading animals is not included within this limit.

There are no specific mandatory requirements within this legislation or elsewhere on space allowances for poultry during transport.

The National Chicken Council animal welfare program (which is voluntary but widely adopted – see section 3.1) does not provide specific limits on either transport time or space allowance, but in respect of catching and transport of poultry, it requires the following:

- A person to be responsible for animal welfare at all times;
- A written training programme for bird catching, handling and transportation;
- A written plan for emergency response and recovery, including accidents;
- Training of catchers to handle birds so that the risk of injury to birds is minimised;
- Transport modules must be appropriately sized and in good repair so that no birds can be injured and none can escape during transit;
- The density in transport modules must allow the birds to sit during transport in a single layer (not on top of one another).

3.3 Animal Health

This section concentrates on legislation and practices in relation to Salmonella and the control of Avian Influenza.

3.3.1 *Salmonella* Control on the Farm

For *Salmonella*, there is no industry-wide legislation in the poultry sector but a strong and long-established voluntary program is in place for breeding poultry as part of the National Poultry Improvement Plan (NPIP)[57]. This Plan consists of a variety of programs intended to prevent and control a range of poultry diseases. Whilst it is not a requirement for all, it is mandatory if inter-state and/or export commerce is undertaken.

[56] https://www.nal.usda.gov/awic/twenty-eight-hour-law
[57] www.poultryimprovement.org

The programs within the NPIP are supervised by the USDA and they are administered by state regulatory agencies so that the industry, together with state and federal government are all involved. Federal government establishes the provisions and specific testing procedures in Title 9 of the Code of Federal Regulations, with Part 145[58] concentrating on breeding poultry. This sets out the requirements for using a range of marketing terms for poultry, including 'pullorum clean', 'sanitation monitored' and 'salmonella enteritidis monitored'.
A summary of the main requirements of the *Salmonella* program in respect of breeder chickens within the National Poultry Improvement Plan is set out in Table 3.

Table 3 - National Poultry Improvement Plan Requirements for Salmonella Control in Poultry Breeder Flocks

Class of Stock	Main Requirements
Poultry Breeder Flocks	Registration of premises
	Adherence to relevant guidelines produced by the competent authority, typically the state veterinarian
	Record keeping on farm and relevant measures to ensure traceability of animals
	Sampling requirements vary according to status (and disease) e.g.: ***'US Salmonella pullorum* clean'** this must be demonstrated based on a blood test undertaken within the last 12 months. Flocks found to be infected with *pullorum* are quarantined until marketed or destroyed under the supervision of the Official State Agency or until subsequently blood tested and identified as clean. **'Sanitation monitored'** requires participation in a program for the prevention and control for Salmonellosis. It is intended to reduce the incidence of *Salmonella* organisms in hatching eggs and chicks, through an effective and practical sanitation program at the breeder farm and in the hatchery. Breeder flocks, hatching eggs and the chicks produced are required to meet a range of requirements as determined by the Official State Agency. This includes flock sanitation, cleaning and disinfection and requires an authorised agent to take environmental samples from breeder flocks at four months of age and every 90 days thereafter. The sample must be tested at an authorised laboratory. If breeder feeds contain animal protein, the protein products must be purchased as appropriate from participants in the Animal Protein Products Industry (APPI) *Salmonella* Education/Reduction program (operated by the National Renderers Association) or the Fishmeal Inspection Program of the National Marine Fisheries Service. ***'Salmonella enteritidis* monitored'** is intended for multiplier breeders and can be used if a series of requirements are met. For example, the flock must originate from a *Salmonella enteritidis* clean primary breeding flock, environmental samples must be taken according to prescribed methods at 16-18 weeks of age and at 40-45 weeks of age. The samples must be examined bacteriologically at an authorised laboratory.

Part 146[59] of Title 9 of the Code of Federal Regulations sets out National Poultry Improvement Plan conditions for commercial poultry. Poultry meat and egg production farms are included within the scope of this and so too are slaughter plants. Under this part of the Plan, poultry equipment and houses are required to be kept in sanitary condition and slaughter plants must be subject to continuous inspection by the Food Safety and Inspection Service (or equivalent). However, there are no specific requirements within Part 146 in respect of sampling and testing for *Salmonella* on poultry meat growing farms.

[59] http://www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=119a83c6b3a4850ff837078ba6eacfa5&r=PART&n=9y1.0.1.7.64

3.3.2 Control of Avian Influenza

Control of Avian Influenza (AI) is included within the voluntary USDA National Poultry Improvement Plan. As for *Salmonella*, (see above) this is mandatory for inter-state and export commerce as state veterinarians do not allow inter-state shipment of un-tested flocks. The key elements of the Plan are surveillance, monitoring, control measures and restrictions on vaccination.

Part 145 of the National Poultry Improvement Plan sets out a program of testing for the prevention and control of AI in breeding flocks. The term 'US Avian Influenza Clean' may be used if the official state agency confirms that the requirements of the program have been met. In summary, the Plan requires samples from flocks to be tested negative for antibodies to avian influenza when more than four months of age and at intervals of 90 days thereafter. Tests must also be negative within 21 days prior to movement of breeding flocks to slaughter.

Part 146 of the National Poultry Improvement Plan sets out AI testing requirements for commercial poultry, which includes egg production, waterfowl and game production and slaughter plants for chickens and turkeys. For these, Official State Agencies are required to develop surveillance programs for H5/H7 low pathogenic AI in their own states. They have some discretion in determining the exact provisions of the program, but the Animal and Plant Health Inspection Service (APHIS) is responsible for assessing that individual state plans are adequate. This is done with reference to the following standards which are set out in Part 146 of the Plan:

- For chicken slaughter plants with a throughput of over 200,000 birds per week, standards can be met through a program whereby a minimum of 11 birds per shift are tested negative for the H5/H7 subtypes of AI. Alternatively, a minimum of 11 birds could be tested no more than 21 days prior to slaughter.

- For turkey slaughter plants with a throughput of over 2 million birds in a 12 month period, standards can be met through a program whereby a minimum of 6 samples per flock have been collected and tested negative no more than 21 days prior to movement to slaughter.

When an AI-positive flock is identified, the area surrounding the particular farm is quarantined until birds within that area can be tested. The quarantine area is expanded until negative flocks are located and infected flocks are depopulated to prevent spread.

The slaughter of poultry to prevent disease spread is set out in federal legislation[60]. This states that when it becomes necessary to slaughter diseased or exposed animals, their purchase is authorised by law and payment will be made to the owner. The control of low-pathogenic H5/H7 strains of AI is addressed elsewhere in legislation[61]. This states that birds infected or exposed may be required to be destroyed at the discretion of the state agency and APHIS. The method of destruction is based on a range of factors, including the risk of spread, the risk to human health and the flock size and species.

APHIS works with a number of other agencies to conduct epidemiological investigations and other studies in relation to AI. The aim is to identify disease pathways and to locate sources of highly pathogenic AI. Together, the various groups combine to provide a continuous survey, by collecting and testing samples from migrating waterfowl and reporting the results.

The main aspects covered by the Plan in relation to AI surveillance, control measures and vaccination are summarised in Table 4 below.

[60] 9 CFR 71
[61] 9 CFR 56.5g

Table 4 - Summary of Key Control Aspects for Avian Influenza (AI)

Activity	Key Aspects
Surveillance	There is a continuous surveillance program by USDA, APHIS Wildlife Services, Veterinary Services and the National Flyways Council of migrating waterfowl in the National Flyways. Collected data are used to track potentially positive zones. The USDA together with federal and state partners and industry monitors bird populations including commercial flocks, backyard flocks and migratory bird populations. In addition to the testing of commercial flocks, extensive testing occurs in live bird markets. The NPIP provides monitoring of broiler chickens before slaughter, as outlined above. A certificate is required by State Public Health Veterinarians for interstate shipment of live poultry.
Control measures following a suspected outbreak	The key elements are: Quarantine; restrict movement of poultry and poultry-moving equipment into and out of the control area; Monitor the region, through testing of commercial flocks, the size of the tested area depends on the findings.
Control measures in the event of an outbreak	Eradicate; humanely euthanize using methods approved by either the USDA or the American Veterinary Medical Association (in extreme cases, this could include ventilation shut-down, allowed on a case-by-case basis); Farmers are compensated by USDA; Restrictions of movements of all materials on and off poultry premises; Implementation of additional biosecurity measures at the infected premises and in the zone established around it, to prevent further spread. Disinfect premises; Test to confirm that the poultry farm is AI virus-free before new birds can be placed
Vaccination	To comply with OIE requirements for flocks to be negative for HPAI, vaccination is not allowed for broilers under any circumstances; The USDA maintains a bank of AI vaccine that could be used to protect healthy birds outside a control area, if necessary.

3.4 Environmental Controls

Environmental protection in the USA is the responsibility of the Environmental Protection Agency (EPA). Separate legislation concentrates on different environmental issues, such as clean water and clean air. In addition, there are regulations to control the storage and handling of hazardous substances as identified by the EPA. These include certain feed ingredients (e.g. vitamin concentrates), medications and preservatives and substances used to clean abattoirs.

3.4.1 Environmental Permitting

The Clean Water Act[62] (which replaced previous legislation and dates back to 1972 with subsequent amendments in the 1980s and 1990s) aims to clean polluted waters and to protect waters that are currently clean. It regulates discharges of pollutants into water and protects the quality standards of surface waters by guarding against both direct and indirect pollution. For poultry, the primary 'direct' source of pollution is from the abattoir and the primary 'indirect' source is from litter application to land.

Under the Clean Water Act, commercial poultry farms with over 125,000 broiler chickens which discharge used litter and waste water to land must hold an environmental permit. For broiler chicken farms, the main concern within the Act is the spreading of used litter, as the quantity of water that is used to clean out the houses between flocks is said to be minimal.

To obtain a permit, farmers are required to apply for and maintain a Nutrient Management Plan which is submitted to the Natural Resources Conservation Service (NRCS)[63] on an annual basis. Nutrient management plans must be written by a 'certified professional' and must include reference to the management of used litter (after removal from houses), specifically its storage, transport and application to land. In addition, there are requirements for nutrient analyses of used litters and soils.

Specific regulations on environmental controls are delegated to state level, so that they can be geared to the particular needs of each. In practice, requirements vary both between states and also within states. This recognises that some have more bodies of water determined to be in danger of becoming polluted than others. Where a specific water course is polluted, the requirements for farmers in that area are much more restrictive than in locations (even within the same state) where the water course is currently clean and is simply being protected.

Land-spreading activities are of particular concern to the authorities and soil testing is required for land on which litter is to be applied. In locations where excesses of a specific nutrient such as phosphorus exist, the spreading of used litter may be restricted to specific times of the year, or even prohibited completely until further testing indicates that the levels would not be a threat to ground water. States may have particular requirements in respect of the land designated for litter spreading and in some cases, remedial work may be needed after land-spreading e.g. particular crops with specific characteristics may have to be planted.

The Clean Water Act also affects other parts of the poultry supply chain including:

- Feed mills which may be required by the Environmental Protection Agency to control particulate matter release. For example, filtration may be required although no equivalent requirements are in place for farms. Where appropriate, noxious gas emissions that might enter the air from the processing of grain and the manufacture of animal feeds must be controlled. There may also be a requirement for listing and reporting substances such as vitamin concentrates that can have corrosive properties[64].

- Poultry slaughter operations are generally required to have a discharge permit in accordance with USDA requirements, because of the large quantities of waste water produced. The permit requires a treatment or control method to prevent excess organic materials and other potential pollutants from entering waterways.

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[62] https://www.epa.gov/laws-regulations/summary-clean-water-act
[63] http://www.nrcs.usda.gov/wps/portal/nrcs/detail/pa/technical/cp/?cid=nrcs142p2_018092
[64] https://www3.epa.gov/ttn/chief/ap42/ch09/draft/draftanimalfeed.pdf

Issues in relation to air pollution in the USA are regulated by the Clean Air Act[65], which dates back to 1970 (with amendments made since, particularly in 1977 and 1990). This is a broad federal law that regulates air emissions from stationary and mobile sources. It also established National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants. At present however, its practical impact on the poultry meat sector is considered to be insignificant and it does not feature in environmental permitting requirements.

3.4.2 Environmental Impact Assessment

The National Environmental Policy Act of 1969 was one of the first laws to establish the broad national framework for environmental protection. Under this Act, the federal government is required to provide an environmental impact assessment (EIA) for any activity it undertakes which has potential to affect the environment. Enterprises other than those of governments that use federal monies must also prepare an environmental impact assessment. Some states also have similar requirements in respect of state funding.

In most cases, there must be an expectation of significant impact to the environment for an EIA to be required. For poultry, an EIA requirement sometimes applies to the construction of feed mills, waste treatment systems or processing plants if they are partly-funded by government grants provided for economic development or for other reasons.

Of the top three poultry meat producing states, only Georgia requires an EIA that might affect poultry production operations and then only if the operation receives funding from the federal government through grant assistance. Where projects are funded entirely by private finance, environmental impact assessments are not required.

3.4.3 Carcass Disposal

Carcass disposal is regulated by individual states, rather than at national level. Approved methods vary between states and are designed to minimise the particular environmental concerns of each one. Approved methods may include composting, purpose-built disposal pits and (less commonly) on-farm burial of carcasses, in addition to incineration and rendering.

Of the three largest poultry meat producing states considered here, Alabama[66] does not allow burial of carcasses on the farm or the use of disposal pits. In Georgia[67], on-farm burial is permitted (subject to compliance with a range of conditions relating to the depth of burial and the distance from water courses). Georgia also allows the use of disposal pits subject to compliance with a range of requirements including site approval by the Georgia Department of Agriculture prior to construction, adequate support provided along the sides of the pit to prevent collapse; disposal pits must also be no more than four feet (approximately 1.2 metres) in width and have a solidly-constructed cover. In Arkansas[68], disposal pits are not allowed, but burial of carcasses is permitted and there is also provision for open-burning (as opposed to controlled incineration).

It is understood that even in states where on-farm burial is allowed, it is now not commonly practiced within the poultry sector.

[65] https://www.epa.gov/laws-regulations/summary-clean-air-act
[66] http://www.adem.state.al.us/programs/water/waterforms/ADAI-ADEMAuthorizedMethodsofPoultryMortalityManagement.pdf (Alabama Department of Agriculture and Industries (ADAI) Alabama Department of Environmental Management (ADEM), Authorized Methods of Poultry Mortality Management Updated October 15, 2010
[67] http://aware.uga.edu/wp-content/uploads/2009/09/Dead-Animal-Disposal-Rule.pdf (Rules Of Georgia Department Of Agriculture Animal Industry Division Chapter 40-13-5 Dead Animal Disposal
[68] http://alpc.arkansas.gov/regulations/Documents/CarcassDisposalLargeAnimal.pdf

Composting is often undertaken and throughout the USA as a means of carcass disposal. In the absence of federal rules, state requirements set out parameters for use. Composting is widely considered to be an acceptable natural, biological process which reduces organic material into a stable and pathogen-free end product but a specialised facility[69] is required. For composting to work, the correct ratios of carbon, nitrogen, oxygen and moisture are required. In practice, it has been found that mixing two or three parts of used poultry litter with one part (by volume) of carcass provides an appropriate carbon to nitrogen ratio.

Incinerators designed for the disposal of animal remains may be used on-farm although they are not allowed in all states. This process is subject to state regulation (through its Environmental Quality Division) to prevent air pollution. However, there are no specific requirements in place for controlling the temperature of the process or for limiting the maximum throughput which may be disposed of in this way.

In the event of high levels of mortality on the farm (whether due to natural causes or compulsory slaughter) so-called 'catastrophic carcass disposal' is also regulated at state level. This ensures that account can be taken of specific and local factors such as geography and geology. In-house composting of catastrophic mortality and burial are the most common approaches, but these must be approved by the state's environmental regulatory department prior to disposal.

4. POULTRY FEED SUPPLY – USA REGULATION

The raw materials used in poultry feeds are of concern to all parts of the production chain. Regulations require that feed mills maintain records of feed ingredients, medications, feed labels and good manufacturing practice (GMP) for production, but there is no mandatory requirement for HACCP[70] based systems for feed mills.

4.1 *Salmonella* Control and General Hygiene Measures

There are no specific regulatory requirements for the testing of *Salmonella* at the feed mill, but voluntary programs are in place.

The Federal Food, Drug and Cosmetic Act[71] (first passed in 1938 but with numerous amendments to date) covers both human food and animal feed within its scope. It requires both to be produced under sanitary conditions, to contain no harmful substances and to be labelled truthfully.

Enforcement of these requirements is undertaken by the Food and Drug Administration (FDA) in co-operation with state and local partners. The FDA (through the Centre for Veterinary Medicine) manages its responsibilities in relation to the safety of animal feeds under a specific Animal Feed Safety System[72]. This includes both required and voluntary components and the scope covers all stages of production and use both at feed mills and farms.

The National Chicken Council guidelines (see also section 3) state that feed mills must meet good manufacturing practices for feed production and must be licensed through the FDA if medicated feeds are produced.

[69] http://www.aces.edu/pubs/docs/A/ANR-0604/ANR-0604.pdf
[70] Hazard Analysis and Critical Control Point (HACCP)
[71] Title 21 of the United States Code of Laws
[72] http://www.fda.gov/downloads/AnimalVeterinary/SafetyHealth/AnimalFeedSafetySystemAFSS/UCM277673.pdf
The System is managed by the Centre for Veterinary Medicine which is part of the FDA

4.2 Animal By-Products in Poultry Feeds

Commercially-produced animal by-products such as meat and bone meal are allowed in poultry feeds in the USA.

There are no regulatory controls on how these are produced but there are several voluntary HACCP-based programs that certify and monitor processed animal protein products. These include the SQF Safe Feed, Safe Food program[73]. The proportion of animal by-products that can be included in poultry feeds is not specified by regulation. Instead, it is determined by an animal nutritionist, based on breed, age and stock requirements.

Some producers choose not to include animal by-products in feeds, for marketing reasons. Labelling to indicate the inclusion or prohibition of certain products must be accurate and feed must be made as indicated on the product label. These requirements are met through voluntary programs.

4.3 Genetically Modified Organisms in Poultry Feeds

Plant materials such as corn and soya are the most common raw materials used in poultry diets. The majority of these are produced in the USA and may therefore come from seed that is identified as GMO.

4.4 Additives and Medications in Poultry Feeds

The Food and Drug Administration (FDA), through the American Association of Feed Control Officials has a role in the regulation of livestock feeds. Mills manufacturing animal feeds which include specific classifications of drugs or drug combinations are required to be licensed with the FDA[74]. The licensing process involves inventory control, testing of the finished product and inspections by the FDA, to ensure that each is being properly used.

All medicated feeds must be sampled regularly, to ensure that inclusion levels meet the labelling requirements. A licence is required to manufacture feeds containing ionophore coccidiostats, whilst the use of sulfanomides to treat coccidiosis requires a veterinary prescription.

In 2015, the FDA promulgated a new regulation covering the use of antibiotics in animal feeds, the Veterinary Feed Directive[75]. Under this Directive and from December 2016, the use of antibiotics at sub-therapeutic levels for growth enhancement will be prohibited in the USA. In addition, any antibiotic which is important to human medicine cannot be used to treat animals without veterinary prescription.

[73] http://www.sqfi.com/wp-content/uploads/SQF-Code_Ed-7.2-July.pdf
[74] Title 21 of the Code of Federal Regulations Part 515 (21 CFR 515)
[75] http://www.fda.gov/AnimalVeterinary/DevelopmentApprovalProcess/ucm071807.htm

5. SLAUGHTER, PROCESSING AND MARKETING

This section focuses in particular on the animal-welfare related legislation that surrounds the slaughter of poultry and on relevant food hygiene requirements, including the decontamination of carcasses after processing.

5.1 Stunning and Slaughter

There are no specific regulations concerning the stunning of poultry in the USA. In order to comply with commercial best practices, stunning is necessary although there is an exception for religious slaughter.

The Humane Slaughter Act of 1978 (first passed in 1958) requires the proper treatment and humane handling of food animals slaughtered in USDA-inspected slaughter plants. It sets out requirements for ensuring that this happens. However, the scope of the Act does not apply to chickens or other birds. Thus, there is an absence of relevant USA legislation in relation to the slaughter of poultry.

The mandated requirements in federal regulations[76] state that 'poultry must be slaughtered in accordance with good commercial practices in a manner that will result in thorough bleeding of the carcasses and ensure that breathing has stopped prior to scalding'. This is generally interpreted as requiring stunning. There are no specific minimum requirements in legislation regarding the electrical currents to be used in water bath stunning of poultry. The Poultry Health Veterinarian, the inspector in charge or his designee is however required by law to perform a routine inspection of slaughter procedures at least once each shift, every day that birds are being killed. At least once per week the establishment records must be reviewed by the veterinarian or inspector to verify adherence to good commercial practices. The day of the week is selected randomly.

5.2 General Food Hygiene Requirements

The Poultry Products Inspection Act[77] of 1957 (as amended) requires the USDA's Food Safety and Inspection Service (FSIS) to inspect all domesticated birds (including chickens, turkeys and ducks) when slaughtered and processed into products for human consumption. In 2014, a new inspection system was introduced, following a 2012 FSIS rule[78] and establishments were given flexibility to operate under this system or under one of the existing inspection systems.

The aim of the inspection is to prevent adulterated or misbranded poultry and products from being sold as food, and to ensure that poultry and poultry products are slaughtered and processed under sanitary conditions. USDA FSIS inspectors must be continuously present in a poultry abattoir for product to be approved for interstate or export sale. Poultry carcasses showing evidence of having died from causes other than slaughter are considered to be adulterated, and must be condemned.

In 1999, FSIS established regulatory sanitation performance standards which are applicable to all official poultry establishments. These were published in the Federal Register[79], setting out objectives to be achieved but they do not prescribe the means of achieving those objectives. The key ones are summarised in Table 5 below.

[76] Title 9 CFR Ch. III (1-1-11 Edition) Subpart I Operations and procedures
[77] http://www.fsis.usda.gov/wps/portal/fsis/topics/rulemaking/poultry-products-inspection-acts
[78] Modernisation of Poultry Slaughter Inspection, FSIS
[79] https://www.gpo.gov/fdsys/pkg/FR-1999-10-20/pdf/99-26983.pdf

Table 5 - Key Food Hygiene Requirements set out in the USDA / FSIS Sanitary Requirements for Official Meat and Poultry Establishments

Performance Standard	Requirements
Establishment grounds and facilities	The grounds about an establishment must be maintained to prevent conditions that could lead to insanitary conditions, adulteration of product, or interfere with inspection by FSIS personnel; Establishments must have in place a pest management program to prevent the harbourage and breeding of pests on the grounds and within establishment facilities. Pest control substances used must be safe and effective under the conditions of use and not be applied or stored in a manner that will result in the adulteration of product.
Construction	Establishment buildings, including their structures, rooms and compartments must be of sound construction, kept in good repair, and be of sufficient size to allow for processing, handling and storage of product in a manner that does not result in product adulteration or the creation of insanitary conditions; Walls, floors and ceilings within establishments must be built of durable materials impervious to moisture and be cleaned and sanitised as necessary to prevent adulteration of product; Walls, floors, ceilings, doors, windows and other outside openings must be constructed and maintained to prevent the entrance of vermin such as flies, rats and mice; Rooms or compartments in which edible product is processed, handled, or stored must be separate and distinct from rooms or compartments in which inedible product is processed, handled or stored, to the extent necessary to prevent product adulteration and the creation of insanitary conditions.
Sanitary operations	All food-contact surfaces, including food-contact surfaces of utensils and equipment, must be cleaned and sanitised as frequently as necessary to prevent the creation of insanitary conditions or the adulteration of product; Non-food-contact surfaces of facilities, equipment and utensils used in the operation of the establishment must be cleaned and sanitised as frequently as necessary to prevent the creation of insanitary conditions or the adulteration of product; Cleaning compounds, sanitising agents, processing aids and other chemicals used by an establishment must be safe and effective under the conditions of use. Such chemicals must be used, handled and stored in a manner that will not adulterate product or create insanitary conditions. Documentation substantiating the safety of a chemical's use in a food processing environment must be available to FSIS inspection personnel for review;

Performance Standard	Requirements
	Product must be protected from adulteration during processing, handling, storage, loading and unloading at and during transportation from official establishments.
Employee hygiene	All persons working in contact with product, food-contact surfaces and product-packaging materials must adhere to hygienic practices while on duty to prevent adulteration of product; Clothing: aprons, frocks and other outer clothing worn by persons who handle product must be of material that is disposable or readily cleaned. Clean garments must be worn at the start of each working day and garments must be changed during the day as often as necessary to prevent contamination or adulteration of product; Disease control: any person who has or appears to have an infectious disease, open lesion, including boils, sores, or infected wounds, or any other abnormal source of microbial contamination must be excluded from any operations which could result in product adulteration until the condition is corrected.

The USDA Sanitation Performance Standards Compliance Guide[80] sets out methods already proven to be effective in maintaining sanitary conditions. It states that establishments that follow this guidance can be 'fairly certain that they are meeting the sanitation performance standards' but that the practices described 'are not requirements'. The Guide covers both meat and poultry establishments and includes key food hygiene requirements. In addition, the USDA has prepared Guidelines for Establishing and Operating Broiler Processing Plants[81]. One of its aims is to serve as a reference for regulatory agencies.

Under the Code of Federal Regulations[82], FSIS-regulated poultry slaughter and processing establishments are required, through a HACCP system to determine the food safety hazards that can occur before, during and after entry into the establishment.

5.3 Carcass Decontamination

The objective of carcass decontamination is to reduce levels of zoonotic pathogens on the surface of poultry carcasses after slaughter and processing and thus improve levels of food hygiene and safety.

Poultry slaughter establishments must maintain written procedures, to prevent contamination of carcasses and parts by enteric pathogens and faecal contamination. These must cover the entire slaughter and dressing operation. As a minimum, they must include sampling and analysis for microbial organisms, in accordance with sampling location and frequency requirements based on legislation. Daily records must be maintained to document the use and monitoring of the procedures, for FSIS review.

[80] http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/San_Guide.pdf
[81] http://naldc.nal.usda.gov/naldc/download.xhtml?id=CAT89231557&content=PDF
[82] CFR 9 417.2

The Code of Federal Regulations (CFR) provide a basis for the approval for food grade substances for use as a decontaminant in poultry and these are widely used in the USA poultry meat sector. An FSIS Directive[83] lists safe and suitable ingredients that may be used. All procedures must be approved by the USDA, to ensure that they are equal to or better than carcasses that have not been treated.

The FSIS Directive lists approved antimicrobial systems for poultry which can be used in on-line and off-line reprocessing. Establishments may use these if they incorporate appropriate procedures into their HACCP plan, sanitation standard operating procedures or other approved prerequisite program. In total, over 40 chemicals and chemical mixtures are approved for use as carcass decontaminants in poultry. A range of application methods is set out, including carcass washes, sprays, dips and drenches, with and without brushes.

5.4 Poultry Meat Marketing

All raw poultry (whole carcasses and portions) sold in the USA and in foreign commerce as well as any imported product must be inspected in accordance with the requirements of the Poultry Products Inspection Act (see Section 5.2).

The Food Safety and Inspection Service (FSIS) of the USDA requires inspected facilities to comply with performance standards for *Salmonella* and *Campylobacter*[84]. The current procedures follow a change made in 2015 and now require random samples of poultry meat to be collected each week from the largest volume processing establishments (or up to six times a month if the risk factor is considered high, because of the volume or the product). The frequency of sampling decreases incrementally for establishments with lower production volume, according to a published schedule.

Separate 'maximum acceptable levels' of positive results are set out in the Federal register for whole chickens, whole turkeys and for comminuted portions and parts (which include ground and mechanically-separated meat). These are set out in Table 7 below. Performance standards are based on data obtained over the previous 7 years, reflecting a reduction in the number of positive samples.

Table 7 - Maximum Percentage of Salmonella and Campylobacter Positives in Samples

Product	*Salmonella*	*Campylobacter*
Broiler carcass	9.8	15.7
Turkey carcass	7.1	5.4
Comminuted chicken	25.0	1.9
Comminuted turkey	13.5	1.9
Chicken parts	15.4	7.7

[83] http://www.fsis.usda.gov/wps/wcm/connect/7f981741-94f1-468c-b60d-b428c971152d/7120_68.pdf?MOD=AJPERES
[84] http://www.fsis.usda.gov/wps/wcm/connect/b711839a-c0b9-420f-9d74-8568310a1352/2014-0023.htm?MOD=AJPERES

A 52 week window of results is maintained and quarterly evaluation is undertaken to establish a compliance category for each premises. Premises are placed into one of three categories and this information is posted on a publically-available website. Details of the categories are set out below:-

Category 1 Establishments operating at 50% or less of the maximum allowable percent positive;

Category 2 Establishments that meet the performance standard, but had more than 50% of the maximum allowable positives;

Category 3 Establishments that failed the performance standard.

On the basis of these categories and the maximum percentages set out in Table 7, the specific requirements for broiler carcasses are summarised in Table 8 below.

Table 8 - Required Salmonella and Campylobacter Standards in Broiler Carcasses for Premises in Each Category (1-3)

Category	*Salmonella*	*Campylobacter*
1	<4.9% of samples positive	<7.8% of sample positive
2	Between 4.9% and 9.8% positive samples	Between 7.8% and 15.7% positive samples
3	>9.8% positive samples	>15.7% positive samples

After poultry has been inspected and determined to meet the standards for wholesomeness as required under the Poultry Products Inspection Act 1957 (i.e. not adulterated, and properly marked, labelled and packaged), the product may be graded by a Federal Grader employed by the USDA Agricultural Marketing Service. This is a voluntary program and the facility must pay a fee for this quality evaluation.

If products are graded in this way, they must meet the specific regulatory standards for the assigned grade. For chickens (and turkeys) the grading system uses a lettering designation, i.e. A, B, C. A USDA 'Grade A' whole poultry must be virtually free from defects such as bruises, discolorations, broken bones and feathers and it must be fully fleshed and meaty. It cannot have skin tears or exposed flesh that could dry out during cooking; it must have a good covering of fat under the skin. The majority of USA's poultry meat is further processed, but grading is most commonly undertaken on whole birds.

USDA regulations on the labelling of poultry are detailed and strictly controlled. They specify product name, inspection legend and establishment number, safe handling instructions, net weight, any added ingredients and nutrition facts. All labels must be approved for use by the USDA, to prevent misleading or false claims. Use of un-approved labels or labelling terms is classified as 'misbranded' and subject to enforcement action.

The use of immersion chilling of poultry is known to result in some level of absorbed moisture. Under the USDA FSIS regulations for meat and poultry[85], there must be a statement of retained water on every package of raw, single-ingredient, whole, ground or cut-up meat or poultry product that retains water during chilling. This applies even though retained water from chilling is not regarded as intentionally added or as a product ingredient. The statement must be prominent and on the principal display panel disclosing the maximum amount of water, and how it was incorporated, e.g. 'contains up to X% retained water,' or 'with X% absorbed water'. If the facility has data clearly demonstrating that their products do not retain water, this statement is not required.

Country of origin labelling (COOL) which was introduced in the USA in 2013 for a range of meats including poultry was subsequently repealed in 2015 and so cannot now be used.

[85] http://www.fsis.usda.gov/OPPDE/rdad/FRPubs/97-054F.html with compliance guidelines at http://www.fsis.usda.gov/OPPDE/rdad/FR-Pubs/97-054F/compliance_guidelines.htm