

THE STRUCTURE OF THE UNITED KINGDOM POULTRY INDUSTRY

Commercial Poultry Sector

Written by an independent consultant. The information contained may not reflect Defra or wider government views.

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EXECUTIVE SUMMARY

1. The brief requires that for the purposes of this report poultry comprises the following species: chickens, turkeys, ducks, geese and quail.
2. The main report will be limited to the above species, excluding quail, kept for commercial purposes. A supplementary report will deal with backyard and rare and fancy breeds of poultry.
3. In evaluating this report it is important to recognise that there is no official register of farms¹, therefore it is impossible to establish accurately the precise number and population size of the farms and the type and scale of bird movements.
4. Over eighty percent of broiler production and commercial egg production is registered with Assured Chicken Production (ACP) and the Lion Code respectively.
5. The chicken meat sector can be separated into a highly sophisticated independent international primary breeding sector and a production sector. The latter is largely controlled by integrated companies that own or control the flocks that produce broiler hatching eggs that are hatched in their hatcheries, the broilers are fed by their feed mills, fattened on their farms and slaughtered in their abattoirs. There is a small but epidemiological important independent production sector in which production is not contracted and may result a more flexible production chain.
6. The egg sector has no primary breeding sector, but independent franchisees with low level breeding stock. There is a variable level of integration in the production sector that in its complete form will be similar to the chicken meat sector with the egg packing station replacing the abattoir. There is a thriving independent sector.
7. The turkey sector can be separated into a highly sophisticated independent international primary breeding sector and a production sector. The latter is largely controlled by integrated companies that own or control the flocks that produce turkey hatching eggs which are hatched in their hatcheries, the turkeys are fattened on their

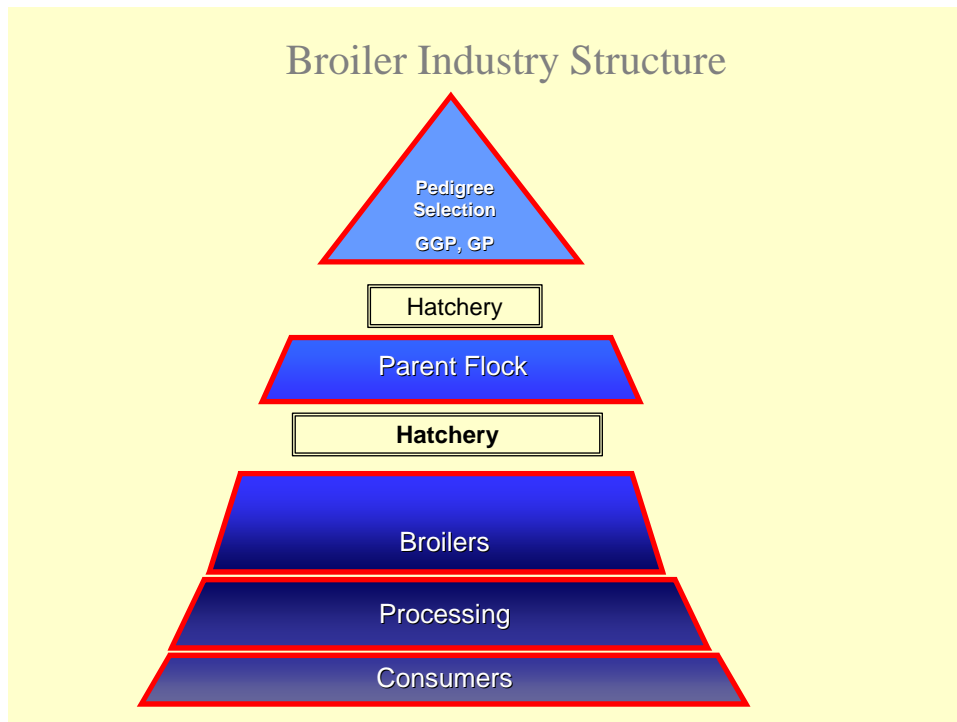
¹ At the time of writing, there was no official register of farms. Since 9th December 2006, the Great Britain Poultry Register has required those with 50 or more commercial poultry to be registered (<http://www.defra.gov.uk/animalh/diseases/vetsurveillance/poultry/index.htm>)

farms and slaughtered in their abattoirs. There is a small but epidemiological important independent primary breeding and production sector, which is more seasonal in nature than the integrated producers.

8. The duck sector has an international primary breeding sector that is owned by an integrator. There is also a local primary breeding sector that is largely controlled by integrators. The division between the primary breeding sector and the production sector is either at grandparent (GP) or Parent Stock (PS) level. Most duck production and slaughter is integrated. There is a small but epidemiological important independent production sector in which production is not contracted and may result a more flexible production chain.
9. The goose sector has virtually no breeding sector (day-old (DO) goslings are currently imported from Denmark or France and possibly Hungary in future) it is not integrated and consists mainly of geese being fattened seasonally on free range.
10. All sectors have a significant number of birds on free range (FR).
11. All sectors, other than turkeys and geese show little seasonal variation in production levels and activities associated with production.
12. The report will pay particular attention to biosecurity and the risks involved with bird movements.
13. The risks posed by the disposal of by-products and waste, excluding abattoir waste, are also addressed.

CHAPTER I

1.1 Meat chicken industry structure



1.1.1 The industry is divided into the primary breeding sector and the production sector. The primary breeding sector will be dealt with separately from the production sector. For the purposes of this report the production sector will range from parent stock (PS) to the abattoir and the primary breeding sector from pedigree to grandparent stock (GP) with the exception of one integrated company that owns grandparent stock.

1.2 Primary Breeding Sector

1.2.1 The two largest international breeding companies supply over ninety percent of the broiler stock in the UK. Only one of them has pedigree stock in the UK. The numbers of primary breeding stock is commercially confidential, however I estimate the numbers on the ground at any one time would be in the hundreds of thousands.

1.2.2 Although the absolute number of pedigree stock used for breeding is small the number of day old pedigree stock produced is relatively large as the percentage of pedigree birds selected for breeding is very small. Although this percentage will vary from company to

company a useful guide would be to assume one percent of males and ten percent of females are finally selected.

1.2.3 The main selection takes place at an age that would allow the rejected birds to be sold for meat. This is a by-product and because of their variable size, quality and relatively small numbers compared to broilers they can be difficult to dispose of to a major abattoir. Their disposal therefore entails the creation of a biosecure barrier between the farm and the abattoir vehicle collecting the birds. This will usually involve loading onto a dedicated farm vehicle and reloading off site onto the abattoir vehicle. The farm vehicle is then cleaned and disinfected off site before returning to the site.

1.2.4 Pedigree stock is kept on high level biosecure farms. Their eggs are hatched in a special pedigree hatchery and their progeny then goes on to the great grandparent (GGP) and GP generations. These eggs would then go to a special GP hatchery to produce PS which passes to the production sector.

1.2.5 PS males and females are different breeds. The female day old chick (DOC) of the male line and the male DOC of the female line are therefore a by-product and sold to the poultry meat sector to be reared for slaughter.

1.2.6 Main Risk Factors

1.2.7 They are the same as those for the different production sectors described below. However because of the higher unit value of the stock, the smaller number of birds involved there is the incentive and time to apply an exceptionally high level of biosecurity.

1.3 Production Sector

1.3.1 Parent Stock

1.3.2 Currently the cumulative annual production to 31 July 2005 is 6.25 million. Their lifespan is sixty weeks resulting in a population of about 7.5 million at any one time.

1.3.3 The purchase of PS is planned and contracted well in advance. In the vast majority of cases it is based on the requirements of the abattoir for finished broilers. Parent flocks are either owned by integrated broiler companies or hatcheries or contracted to them on a long-term basis.

- 1.3.4 With the exception of a very small number of organic parents that are on Free Range (FR) all parents are kept in secure housing.
- 1.3.5 The female and male birds are purchased at day old (DO) from a primary breeding company. The overwhelming majority are placed on specialist rearing farms until approximately eighteen weeks of age (for the purposes of this report these will be classified as point of lay (POL) birds at the time of moving) and are then moved to production farms. Although more than one flock may be housed on a farm at any one time, in the overwhelming majority of cases each flock is kept as a separate biosecure unit and is moved to a production unit(s) in its entirety.
- 1.3.6 There are one hundred and thirty four rearing farms registered with Assured Chicken Production (ACP) that is in turn affiliated to Assured Food Standards. As a farm has to be registered with ACP even if only part of its future production is contracted to ACP units, it is likely that over 90% of flocks and birds are registered with ACP. These farms would conform to ACP biosecurity standards.

1.3.7 Main Risk Factors on Rearing Farms

- Vaccination teams (most vaccines are given prior to moving).
- Vehicles, containers and catching teams used to transport birds to production units.
- Additional risk factors are listed in the section on broiler growing.

The overwhelming majority of POL birds are placed on specialist production farms until they are sent for slaughter (depleted) at approximately sixty weeks of age. More than one flock may be housed on a farm at any one time, but in the overwhelming majority of cases each flock is kept as a separate biosecure unit and is usually depleted in its entirety.

There are three hundred and thirty six production farms registered with ACP. As a farm has to be registered with ACP even if only part of its production is contracted to ACP units it is likely that over 90% of flocks and birds are registered with ACP. These farms would conform to ACP biosecurity standards.

1.3.8 Main Risk Factors on Production Farms

- Vaccination teams if vaccination not completed during rearing.
- Hatching egg (HE) collection vehicles, equipment, packaging material and staff.
- Reject egg collection vehicles, equipment, packaging material and staff.
- Weekend relief staff.
- The disposal of surplus males just prior to the commencement of lay.
- The acquisition of replacement males due to a shortage of males during the laying period.
- Additional risk factors are listed in the section on broiler growing.

1.4 Hatchery

- 1.4.1 There are twenty four hatcheries owned by nine companies producing virtually all the approximately eight hundred and sixty three million broiler chicks hatched annually in the UK. The four largest companies produce over 80% of the DOC. Twenty one of the twenty four hatcheries producing approximately 94% of DOC are members of ACP.
- 1.4.2 With one exception integrated companies own all the hatcheries described above. Six of the hatcheries are owned by a company that is not completely integrated in that it does not own its own abattoir or feed mill.
- 1.4.3 Production volumes of individual hatcheries vary from approximately three hundred thousand up to one to two million per week. Based on a hatchability of 80% a hatchery, producing say 1.5 million DOC per week and an incubation period of three weeks, would have 5.6 million eggs in the incubator of which, based on the chicks emerging from the shell over the final two day period, approximately four hundred and thirty thousand would be immature DOC. Assuming the hatchery hatches four days per week there could be an additional three hundred and seventy five thousand DOC waiting to be dispatched on hatch days.
- 1.4.4 Depending on the size of the egg bank there could be nearly two million eggs, which is a week's supply in storage.

1.5 Hatching Egg and Day Old Chick Movements

1.5.1 HE would generally be collected on a weekly or twice weekly basis from parent farms. However one of the integrators in Northern Ireland specialises in producing HE for mainland hatcheries and these HE would be dispatched from a central store to various hatcheries in Great Britain.

1.5.2 Most hatcheries owned by integrators would tend to produce just enough DOC for their own needs. However in the event of a shortage or surplus there would be both HE and DOC movement between companies. The independent broiler sector is supplied by two of the hatchery owning companies. This sector is estimated as nine percent of the total market.

1.5.3 Imports mainly in the form of HE and occasionally DOC occur in times of shortage. The imports are usually from within the EU. Imports are sometimes intermittent but occasionally when medium term shortages occur imports occur on a continuous basis and the volumes can be significant.

1.5.4 DOC are usually delivered on the day they are hatched directly to broiler farms. A delivery vehicle may deliver to more than one farm per trip.

1.5.5 Main Risk Factors

- HE and DOC collection and delivery vehicles and containers can become contaminated during farm-to-farm deliveries and collections if not effectively cleaned and sanitised.
- Drivers not following biosecurity procedures.
- Imports of HE and DOC arriving in contaminated vehicles and containers.
- Disposal of non-hatching eggs, unhatched eggs, culled chicks and contaminated packaging materials.

1.6 Broiler growing sector

1.6.1 Based on census figures there are approximately three thousand broiler farms in the UK. Each farm will produce between 5 and 7.5 batches of broilers per year i.e. 5-7.5 times their stated capacity. Currently there would be approximately one hundred and twenty

million broilers on the ground at any one time of which approximately 5% would be on FR.

1.6.2 It is important to note that the overwhelming bulk of production is produced by a relatively small number of large farms.

1.7 Bird Movement

Farms containing housed broilers operating within an integration

1.7.1 The vast majority of farms will either be owned by the integrator or be tied to the integrator by tight long-term contracts that would usually involve the supply of DOC and with one major exception feed.

1.7.2 DOC will arrive over a period of one to three days and for practical purposes are regarded as a single placement. Ready to market birds will be removed to slaughter to one or more abattoirs owned by the company. There is however a low level of exchange of birds between different companies.

1.7.3 Depending on the market weight required, individual sheds might have the first birds removed a few days before the bulk of the birds are removed. This process is known in the industry as “thinning”. The majority of broilers are slaughtered between thirty five and forty two days of age. The farms will be totally depopulated before the next batch of DOC arrive this is known as “the all in all out system” and is a requirement of ACP membership.

1.7.4 Main Risk Factors

- Catching vehicles, equipment, bird containers and staff require particular attention. Cleansing and disinfection together with the use of clean protective clothing needs to be tightly controlled. The risks are considerably reduced if the house is depopulated within a forty eight hour period and birds are going to one or two abattoirs within the same integrated operation, as the disease status is known and the abattoir owner has an incentive not to infect his own farms. The risk is further reduced if the catching contractor is operating entirely or largely within one integration.
- In-house or contracted cleaning teams may present a risk. This risk is clearly reduced where they work for a single or limited number of owners. It is also practical to further reduce the risk by ensuring that vehicles and equipment are effectively cleaned

and sanitised between farms and that their staff employs effective biosecurity procedures.

- DOC delivery vehicles, containers and drivers. The containers and sometimes the drivers enter sheds.
- Feed delivery vehicles and drivers (refer to feed section).
- Dead bird collection vehicles and containers.
- Litter disposal vehicles.

1.7.5 There are farms containing FR birds operating within some integrations. (This section should be read in conjunction with the main section on FR farms). These farms present similar biosecurity problems to those described under the general section on FR. However there are a number of factors that reduce the risk to those operating within an integration:

- The different age groups of birds on any one farm are usually kept separate.
- The higher turnover makes it easier to depopulate farms more frequently.
- The disease status of the other farms visited by the catching team will be known.

Free range farms including organic farms outside the integrated sector

1.7.6 DOC placements are variable, they may arrive over a short period or they may even be placed on a weekly basis. In some cases they will receive young birds that have been brooded on another farm, as they do not have brooding facilities. The timing of the removal of birds for slaughter varies considerably from farm to farm. The pattern may be similar to that of integrated farms or may involve removal on an almost daily basis. Separation of the flocks might be say a field or in some instances a simple wire fence.

1.7.7 Some of these farms may be depopulated on a broadly similar timescale to integrated farms others about once a quarter and some never.

1.7.8 Main Risk Factors

1.7.9 The risks posed by catching teams are the same as those described above. They may in some instances be exacerbated by the fact that they visit farms owned by a large number of operators and a vehicle and team may frequently visit several farms under different ownership and control on a single day. In some cases a vehicle and team may even pick up birds from two or more farms under different ownership on the same load.

1.7.10 In those cases where cleaning and sanitising teams are used the risk is the same as that described above, however in many cases farmers will carry out this function themselves.

1.7.11 On some units feed and water might be supplied outside the sheds, this as far as I can ascertain is actively encouraged in the organic sector. I am given to understand that the organic sector also favours the presence of open water on range. These practices are extremely high risk. **(Birds are currently fed and watered indoors because of the risk of AI)**

1.7.12 Pools of open water will be present on many ranges especially after it has rained and some range areas will in any case contain ponds and streams.

1.7.13 The chickens will inevitably have direct and indirect contact with wild birds and their faeces.

1.7.14 Local non-migratory wild birds including game birds also present a risk as indirect vectors.

Suppliers to the small independent abattoirs

1.7.15 This sector is estimated at nine percent of the total market. As far as I can ascertain that apart from totally independent producers there are seven groups of producers that supply these abattoirs whose throughputs vary from sixty to two hundred thousand birds per week.

1.8 Bird movements

1.8.1 One operator specialises in contracting numerous farms, some of which are large and high quality modern units, and supplies approximately twenty small throughput abattoirs. He also supplies

into the integrated market at times. This company handles five hundred thousand birds per week.

- 1.8.2 Farms in this sector vary from large farms with high quality modern buildings to small farms with small dilapidated buildings. Biosecurity standards will vary from high to almost nonexistent.
- 1.8.3 DOC placements are variable, they may arrive over a short period or they may be placed over an extended period.
- 1.8.4 Thinning of birds would be widely practiced and on average the period between the first and last birds being slaughtered in a shed would be longer than on integrated farms.
- 1.8.5 The crucial difference between these farms and integrated farms is that on any given day birds from a farm and even from a single shed may be supplied to several different abattoirs owned by different operators. This will in some but not all cases involve catching teams and vehicles under more than one ownership.

1.8.6 Main Risk Factors

- 1.8.7 All the risk factors that apply to farms operating within an integration plus the following are applicable:
 - Routine veterinary advice on issues such as biosecurity and disease prevention will vary from farm to farm and may in a few cases be non-existent.
 - Some but not all of the abattoir owners have limited knowledge of disease or disease transmission and biosecurity.
 - Catching teams and vehicles will be visiting a range of farms and abattoirs that have no mutual interest in biosecurity.

1.9 Feed Mills

- 1.9.1 Most integrated operations have their own feed mills. Feed mills owned by a small number of companies feed the rest of the industry.
- 1.9.2 It is generally accepted that the exterior of the vehicle, the driver's cab and the driver must comply with a range of biosecurity standards.
- 1.9.3 However feed is delivered in a closed body vehicle that has to go alongside the poultry house to discharge its load. The contents of

the body are then replaced by air laden with dust from the poultry house.

1.9.4 ACP and Lion Code standards require that members purchase from feed suppliers including in house suppliers that conform to standards set by equivalent assurance schemes that in turn have to purchase their raw materials from sources that are also members of equivalent assurance schemes. Many non-members of ACP and the Lion Code will benefit from this arrangement, as all the major feed suppliers would be members of their industry assurance scheme.

1.9.5 Main Risk Factors

- Contamination of feed delivery vehicles.
- Contamination of badly stored raw materials.

1.10 Abattoirs

1.10.1 The classification of white meat abattoirs by the Meat Hygiene Service (MHS) is not consistent throughout the UK; this makes it difficult to arrive at a precise figure for chicken abattoirs. I am satisfied however that the figures are sufficiently robust for the purposes of this exercise.

1.10.2 As far as I can ascertain from the MHS register there are approximately fifty-seven abattoirs that slaughter domestic fowl (*Gallus gallus*) exclusively and thirty-eight that slaughter domestic fowl and other species including ducks and geese in the UK. Approximately fifty-eight of these are full throughput (FT) and thirty-seven are low throughput (LT).

1.10.3 Those operations that rely on multiple sourcing and slaughter several species require higher standards of biosecurity than those in a tightly integrated operation.

1.10.4 Birds supplied to some of these operations have long journey times, particularly end of lay hens, some also hold birds overnight and may collect from more than one farm per single vehicle trip. These factors need to be considered in any risk assessment.

1.11 By-product disposal

1.11.1 Approximately five hundred thousand tonnes of different types of offal and feathers are produced annually and have to be disposed of.

1.11.2 Disposal has been much more tightly controlled in recent years. However even material that is going for destruction could present a risk if not transported in secure vehicles following strict biosecurity procedures.

1.11.3 There are markets in Asia for some by-products such as feet, and gizzards are a delicacy in some countries. Depending on market requirements and the vagaries of trade restriction some products have an export market, others might go for pet food and others have to be destroyed. These markets are not stable and the methods of disposal of these by-products vary from time to time. Feathers used to be heat treated and used in pillows, duvets etc. This market has been destroyed by cheap imports from China and feathers where possible are exported or alternatively destroyed.

1.11.4 Main Risk Factors

1.11.5 In the integrated sector risk is reduced by accurate knowledge of the disease situation of the farms within the organisation, cleansing and disinfecting of catching vehicles etc, well co-ordinated biosecurity and the common interest of the parties involved.

- In practical circumstances considerable effort is required to sanitise catching vehicles and crates or modules 100% effectively.
- In practical circumstances considerable effort is required to ensure that the personal hygiene of catchers is of an acceptable standard.
- As the diagnosis of LPAI could easily be missed the risk of LPAI infected birds spreading LPAI via abattoirs through the catching process must be considered. Especially in the case of depleted end of lay breeders and commercial layers and any birds on FR or seasonal turkeys in insecure accommodation. Mixed species abattoirs that include ducks or geese and other poultry could be the greatest risk of all.
- The risk of HPAI being spread unknowingly is paradoxically far less than that of LPAI.
- The disposal of offal particularly the transport of raw offal can present a risk.

Disposal of waste from all sectors

1.12 Disposal of used litter (a mixture of bedding material & faeces)

1.12.1 Litter is currently disposed of by burning in a power station, spread on agricultural land or composted. This only presents a risk if LPAI has gone undiagnosed in the flock that had been housed on the litter.

1.13 Disposal of dead birds

1.13.1 ACP standards state “Dead birds must be held in vermin proof containers until appropriate disposal, either off or on site in line with the Animal By-Products Regulations, can be effected.” Basically in this case ACP standards simply emphasise the legislation that should be implemented on all farms. The only question is can it be effectively policed, as non ACP farms do not receive an independent audit by a recognised body.

1.13.2 Clearly any collection system that goes from site to site and takes the carcasses to a central collection point presents some level of risk however carefully managed if LPAI has gone undiagnosed.

1.14 Disposal of hatchery waste

1.14.1 The waste consists mainly of unhatched eggs and a small number of dead culled chicks. The waste is often macerated before disposal. The bulk is transported in closed skips and usually disposed of by off-site incineration. The culled chicks are sometimes sold to owners of raptors including zoos.

CHAPTER II

2.1 Commercial layer industry structure

2.1.1 The industry is divided into the breeding sector and the production sector. The breeding sector will be dealt with separately from the production sector. For the purposes of this report the production sector will cover commercial stock, egg packing stations and slaughterhouses (SH). The breeding sector covers GP, PS and the hatchery.

2.2 Breeding sector

2.2.1 This sector is far more basic than the equivalent chicken or turkey meat sectors. The UK breeding companies are essentially franchisees of international breeding companies and only hold GP and PS flocks, they have no GGP or pedigree birds.

2.2.2 GP flocks produce HE that are hatched in dedicated hatcheries or hatcheries that handle eggs from both GP and PS flocks.

2.2.3 Three to four hundred thousand GP and PS hens plus about thirty thousand males would have been required to produce approximately thirty two million laying hens annually in the UK.

2.2.4 The purchase of GP and PS is planned and contracted well in advance and in the vast majority of cases is based on the anticipated requirements of the commercial sector.

2.2.5 The female and male GP are imported at day old (DO) or as HE from a true primary breeding company. Some of these DOC are placed in day old to death units but the vast majority are placed on specialist rearing units and then moved to production units until depletion. They are kept in secure housing. Although more than one flock may be housed on a farm at any one time, in the overwhelming majority of cases each flock is kept as a separate biosecure unit.

2.2.6 The GP HE would be sent to the hatchery and produce male and female PS DOC that in turn would be housed in much the same way as the GP birds.

2.2.7 There are twelve breeder rearing farms owned by four companies registered with the British Egg Industry Council (BEIC) to the Lion Scheme. There are forty two breeder production farms owned by

nine companies registered with BEIC, of these nine are in other EU member states. As a farm has to be registered with BEIC even if only part of its production is contracted to BEIC registered units it is likely that well over 90% of flocks and birds are registered with BEIC.

2.2.8 Main Risk Factors

- Vaccination teams.
- Vehicles, containers and catching teams used to transport POL birds to production units.
- HE collection vehicles, equipment, packaging material and staff.
- Reject egg collection vehicles, equipment, packaging material and staff.
- Weekend relief staff.
- Vehicles, containers and catching teams used to transport birds to abattoir if there is more than one flock on a farm.
- The disposal of surplus males just prior to the commencement of lay.
- Additional risk factors are listed in the section on broiler growing.

2.3 Hatchery

2.3.1 There are six hatcheries owned by five companies producing virtually all the approximately thirty two million female layer chicks (sixty four million including males) hatched annually in the UK. They are all registered with BEIC. One hatchery which belongs to a breeding company and hatches for two other companies produces 22.5 million layer chicks per annum which is approximately 70% of the UK production.

2.3.2 Based on a hatchability of 90% the hatchery, producing 22.5 million DO layer females or including the same number of males produces a total of forty five million DOC per annum.

2.3.3 As the incubation period is three weeks, they would have 2.9 million eggs in their incubators at any one time of which, based on the chicks emerging from the shell over the final two day period, approximately two hundred and fifty thousand would be immature DOC (including 50% males which would become by-product). It is

quite probable that on any given day fifty thousand female DOC could be waiting for dispatch.

2.3.4 Depending on the size of the egg bank there could easily be nearly one million HE, which is a week's supply in storage.

2.3.5 DOC are hatched to batch order unlike meat DOC that are produced in regular daily numbers. This means that the foregoing figures are average rather than the actual figures that could vary significantly.

2.3.6 There is one hatchery that produces partially incubated eggs to provide embryonated eggs for human influenza vaccine.

2.4 HE and DOC movements

2.4.1 HE would generally be collected on a weekly or twice weekly basis from GP or PS farms.

2.4.2 DOC are transported to rearing farms, usually within twenty four hours of hatching. In the case of GP to PS rearing farms and in the case of PS to commercial layer rearing farms.

2.4.3 Imports mainly in the form of HE and occasionally DOC occur regularly as some breeder production farms are outside the UK. The imports are usually from within the EU.

2.4.4 Main Risk Factors

- HE and DOC collection and delivery vehicles and containers can become contaminated during farm-to-farm deliveries and collections if not effectively cleaned and sanitised.
- The hatchery can potentially act as central conduit of infection.
- Drivers not following biosecurity procedures.
- Imports of HE and DOC arriving in contaminated vehicles and containers.
- Collection for disposal of non-hatching eggs, unhatched eggs, culled chicks and contaminated packaging materials.

2.5 Production Sector

2.5.1 Commercial layer rearing farms

2.5.2 There are two hundred and seventy five specialist rearing farms registered with BEIC. Their individual capacity per batch of birds varies from under five thousand to over one hundred and forty

thousand with a total capacity of twelve million per rear. Many of these farms, although run as separate enterprises, would be in the same ownership as some of the large production units. It is quite feasible for these farms to rear 2.5 batches per year. These farms would rear more than the 85% of layers carrying the Lion Mark, as they would be registered with BEIC even if they were not supplying 100% of their production to members of the scheme.

2.5.3 The female birds are purchased as DOC from the hatchery. There will often be more than one flock (age group) on a site. However with few exceptions each flock would be in a separate biosecure unit and would be moved to a production site(s) in a single tranche. Each unit but not necessarily the site would usually be all in all out.

2.5.4 Birds are usually reared on the floor in sheds or in special cage rearing units. Apart from the brooding period organic layers are usually reared on FR.

2.5.5 Although there are a vast number of small production farms rearing, because of the high capital cost of brooding facilities (the heated environment required by DOC) that would only be used occasionally on small farms, is regarded as a specialist operation. It is therefore common practice for the small commercial producers and hobbyists to buy from large rearing operators.

2.5.6 At fourteen to sixteen weeks of age the birds are moved to production units and at this stage are classified as POL pullets. Most independently reared birds are reared on contract however some are reared speculatively.

2.5.7 Main Risk Factors

- Vaccination teams. (Most vaccines are given prior to moving).
- Vehicles, containers and catching teams used to transport birds to production units.
- Additional risk factors are listed in the section on broiler growing.

2.6 Commercial layer production farms

2.6.1 The census figures need to be treated with caution, however they do provide a reasonable picture of the number and size of flocks and farms. If one takes the figures at face value, at least 25% of layers

are on FR units and a small percentage in barn units and the rest in cages.

2.6.2 There are eight hundred and sixty five farms registered with BEIC to carry the Lion Mark. These range in size from under five thousand to one million four hundred thousand birds. Census figures indicate that there are in excess of thirty thousand flocks (not sites) in the UK. Even taking account of the fact that there is often more than one flock on a site it would seem that 75% of the birds are on a relatively small number of large units.

2.6.3 While there are many small FR flocks there are some extremely large units.

2.6.4 There are clearly an unquantifiable but large number of farms with less than three hundred and fifty layers that are not covered by the egg marketing regulations. These will produce eggs for local sale or home use.

2.7 Bird and egg movement

2.7.1 The overwhelming majority of POL birds are placed on large specialist laying farms. These birds will remain on the farm until they are sent for slaughter at seventy plus weeks of age. In the majority of cases there is more than one flock on a site and even though each flock is usually depleted as a unit, most of the farms are never depopulated. Occasionally small numbers of POL pullets will be sold to neighbours shortly after arrival.

2.7.2 An egg conveyor belt that will pass through several sheds will link many of the sheds on the larger cage unit sites.

2.7.3 Eggs are collected frequently from the larger sites and delivered to egg packing stations. There are, however a number of large production sites that have packing stations on site.

2.7.4 Main Risk Factors

- The movement of commercial POL birds from rearing to production farms.
- Vehicles, equipment and staff of the cleaning and disinfecting team if there is more than one flock on a farm.
- The depletion of end of lay hens is also more risky than broiler depletion as the majority of layer farms are never depopulated

and inadvertent contact between catching teams and the remaining birds is a risk.

- Egg collection vehicles, packaging materials and drivers.
- The presence of some egg package stations on production farms.
- FR layer sites will have more frequent vehicular visits than FR broiler sites because of eggs collection.
- Direct on farm selling to the public will result in multiple human contacts with people who may have contact with other birds.
- Feed delivery vehicles and drivers.
- Dead bird collection vehicles and containers.
- Manure disposal vehicles.

2.8 Egg Sales

2.8.1 The vast majority of eggs are sold via packing stations. This as stated earlier involves the regular vehicular collection of eggs. Some units have packing stations on them and in those instances the eggs may be moved by conveyor belt directly from the laying units to the packing station.

2.8.2 A minority of eggs, particularly FR and organic, are sold directly to the consumer on the farm.

2.8.3 Some farms still have egg rounds that involve delivering to local shops and individual consumers.

2.9 Feed Mills

2.9.1 This sector should be read in conjunction with the section on feed mills in the chicken meat sector.

2.9.2 The degree of integration is significantly less, although several large producers own their own feed mills. There would tend to be more and less specialised independent mills supplying the egg sector.

2.10 Abattoirs

2.10.1 This sector should be read in conjunction with the section on abattoirs in the chicken meat sector.

2.10.2 End of lay hens are largely disposed of through a small number of specialist old hen plants. There is little demand for the product in the UK as fresh or frozen chicken or even as boneless meat.

Carcasses are often exported to third world countries or used for soup production.

Disposal of waste from all sectors

2.11 Disposal of manure

2.11.1 The disposal of manure presents all the same problems presented by the disposal of used litter from the chicken meat sector.

2.12 Disposal of dead birds

2.12.1 Similar to the chicken meat sector.

2.13 Disposal of hatchery waste

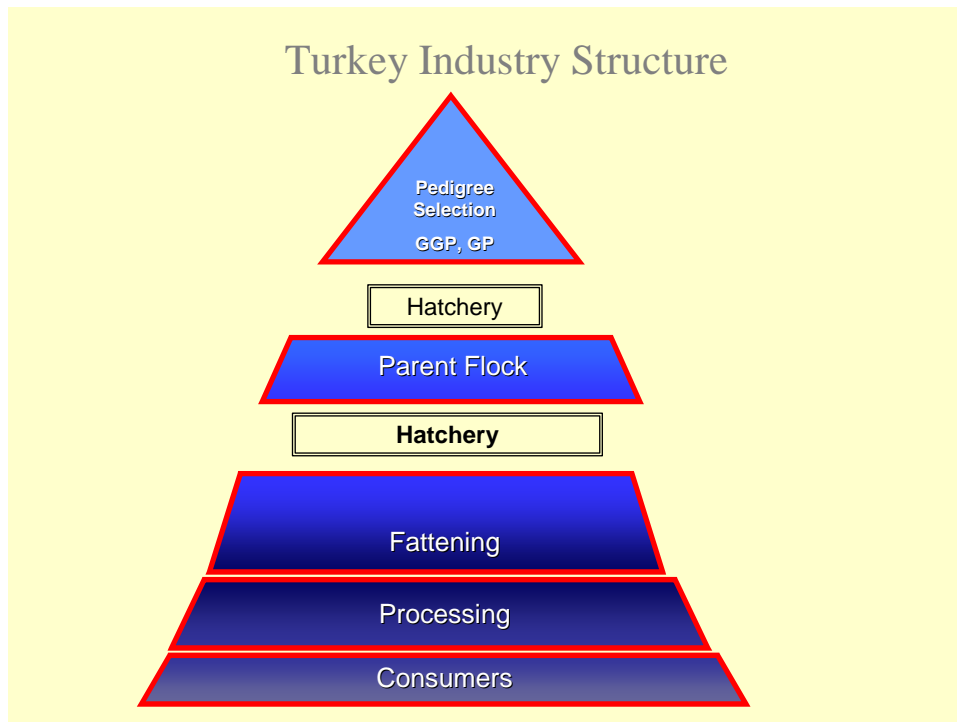
2.13.1 The waste consists of unhatched eggs and a large number of dead culled chicks as all the males are culled. The waste is often macerated before disposal.

2.13.2 The bulk is transported in closed skips and usually disposed of by offsite incineration.

2.13.3 Some of the culled chicks may be sold to owners of raptors including zoos.

CHAPTER III

3.1 Turkey Industry Structure



3.1.1 The industry is divided into the primary breeding sector and the production sector. The primary breeding sector will be dealt with separately from the production sector. For the purposes of this report the production sector will range from parent stock (PS) to the abattoir and the primary breeding sector from pedigree to grandparent stock (GP).

3.2 Primary Breeding Sector

3.2.1 One of the largest international breeding companies supplies the vast bulk of stock to the mainstream production sector. It has the full generational range of stock in the UK. The numbers of primary breeding stock is commercially confidential. Its birds are on twenty farms and eggs are hatched in two hatcheries.

3.2.2 Although the absolute number of pedigree stock used for breeding is small the number of day old pedigree stock produced is relatively large as the percentage of pedigree birds selected for breeding is very small. (The actual numbers involved will be much lower than those in the chicken meat sector.)

- 3.2.3 Although this percentage will vary a useful guide would be to assume one percent of males and ten percent of females are finally selected.
- 3.2.4 The main selection takes place at an age that would allow the rejected birds to be sold for meat. This is a by-product and because of their variable size, quality and relatively small numbers compared to that produced by most large scale commercial fattening farms they can be difficult to dispose of to a major abattoir. Their disposal therefore entails the creation of a biosecure barrier between the farm and the abattoir vehicle collecting the birds. This will usually involve loading onto a dedicated farm vehicle and reloading off site onto the abattoir vehicle. The farm vehicle is then cleaned and disinfected off site before returning to the site.
- 3.2.5 Pedigree stock is kept on high-level biosecure farms. Their eggs are hatched separately from the other eggs and their progeny then goes on to the great grandparent (GGP) and GP generations The GP eggs would then produce DO PS that passes to the production sector.
- 3.2.6 Artificial insemination is standard practice in turkey breeding and usually carried out by special teams.
- 3.2.7 PS males and females are different strains. The female DOC of the male line and the male DOC of the female line are usually a by-product and sold to the poultry meat sector to be reared for slaughter.
- 3.2.8 In addition to the breeding organisation described above the turkey sector has a small but significant breeding sector that produces a range of traditional birds for the so-called Farm Fresh sector (FF). There are a number of small breeding companies in this sector who would breed in the traditional way.

3.2.9 **Main Risk Factors**

- They are the same as those for the different production sectors described below. However because of the higher unit value of the stock, the smaller number of birds involved there is the incentive and time to apply an exceptionally high level of biosecurity.

3.3 Production Sector

- 3.3.1 The turkey industry has its own assurance scheme known as Quality British Turkey (QBT). Independent accredited auditors audit the scheme.
- 3.3.2 The scheme includes about 80% of turkeys, but does not include FR at present however they are expected to be brought into the scheme in 2006.
- 3.3.3 Approximately 95% of turkeys sold to major retailers are QBT. The scheme requires that feed is purchased from feed mills registered with the current accredited QA scheme for feed mills.

3.4 Parent Stock

- 3.4.1 There are approximately two hundred and fifty thousand PS on approximately forty farms.
- 3.4.2 The purchase of PS is planned and contracted well in advance. In the vast majority of cases it is based on the requirements of the abattoir for finished turkeys. Parent flocks are either owned by integrated turkey companies or hatcheries or contracted to them on a long-term basis.
- 3.4.3 The female and male birds are purchased at day old (DO) from a primary breeding company. The majority are placed on specialist rearing farms and are then moved to production farms at POL. Most rearing housing, with the exception of some traditional and organic operations, is usually bird proof.
- 3.4.4 Although more than one flock may be housed on a farm at any one time, in the overwhelming majority of cases each flock is kept as a separate biosecure unit and is moved to a production unit(s) in its entirety.

3.4.5 Main Risk Factors on Rearing Farms

- Vaccination teams.
- Vehicles, containers and catching teams used to transport birds to production units.
- Additional risk factors are listed in the section on broiler growing.

The overwhelming majority of POL birds are placed on specialist production farms until they are sent for slaughter (depleted). More than one flock may be housed on a farm at any one time, but in the overwhelming majority of cases each flock is kept as a separate unit and is usually depleted in its entirety. Some of the housing on production farms is not bird proof.

3.4.6 Main Risk Factors on Production Farms

- Housing is not always secure.
- Vaccination teams if vaccination not completed during rearing.
- The majority of turkey hens are fertilised by artificial insemination. This is usually carried out by specialist teams that go from site to site and in some instances the males are on separate sites to the females.
- Hatching egg (HE) collection vehicles, equipment, packaging material and staff.
- Reject egg collection vehicles, equipment, packaging material and staff.
- Weekend relief staff.
- Vehicles, containers and catching teams used to transport birds to abattoir if there is more than one flock on a farm.
- Vehicles, equipment and staff of the cleaning and disinfecting team if there is more than one flock on a farm.
- The acquisition of replacement males due to a shortage of males during the laying period.
- Additional risk factors are listed in the section on broiler growing.

3.5 Hatchery

3.5.1 There are seven hatcheries owned by six companies, two of these are seasonal. Two integrated companies own the three largest. Assuming the largest hatchery produces ten million DOC per annum at a hatchability of 75% and an incubation period of twenty eight days there would be approximately one million eggs including approximately fifty four thousand immature DOC in the incubator. There could also be approximately two hundred and fifty thousand eggs in the egg store and fifty thousand DOC ready for delivery.

3.6 HE and DOC movements

3.6.1 HE would generally be collected on a weekly or twice weekly basis from parent farms.

3.6.2 Most hatcheries owned by integrators would tend to produce just enough DOC for their own needs. However in the event of a shortage or surplus there would be both HE and DOC movement between companies.

3.6.3 DOC are usually delivered within twenty four hours of being hatched direct to fattening farms. However a small but significant minority destined for small operations would go to brooding farms and once the birds are feathered they would be delivered to a fattening farms, these birds are known as brooded poults. A delivery vehicle may deliver to more than one farm per trip.

3.6.4 Main Risk Factors

- HE and DOC collection and delivery vehicles and containers can become contaminated during farm-to-farm deliveries and collections if not effectively cleaned and sanitised.
- Drivers not following biosecurity procedures.
- Imports of HE and DOC arriving in contaminated vehicles and containers.
- Disposal of non-hatching eggs, unhatched eggs, culled chicks and contaminated packaging materials.

3.7 Turkey fattening sector

3.7.1 Twenty one million fattening turkeys are produced annually. There are roughly six million turkeys on the ground at any one time. The numbers obviously peak in the second half of the year.

3.7.2 As far as I can ascertain (there is no verifiable information) several thousand small farms grow turkeys for Christmas. Many are on mixed livestock holdings that could include pigs.

3.7.3 I have not managed to obtain figures that would give an accurate estimate of the approximate number of farms involved. The bulk of production is on a relatively small number of large farms owned by or contracted to the two remaining integrated operations. However a relatively higher percentage of birds, if the Christmas trade is taken into account, are on smaller farms than in the chicken meat sector.

Separate brooding with a move to a fattening farm although not a large factor is relatively more common than in the chicken sector.

3.8 Bird Movements

Farms containing housed turkeys operating within the integrated sector

- 3.8.1 The vast majority of birds will be housed on large farms that will either be owned by the integrator or be tied to the integrator by tight long-term contracts that would also involve the supply of DOC and possibly feed.
- 3.8.2 DOC will arrive over a short period of time and for practical purposes be regarded as a single placement.
- 3.8.3 Ready to market birds will be removed to slaughter to one or more abattoirs owned by the company. There is however a low level of exchange of birds between different companies.
- 3.8.4 Depending on the market weight required, individual sheds might have the first birds removed a significant period before the last ones are removed.
- 3.8.5 Turkey slaughter age varies significantly depending on market requirements.
- 3.8.6 Effectively most of the larger farms will be totally depopulated before the next batch of DOC arrive. This is known as “the all in all out system”.

3.8.7 Main Risk Factors

- Catching vehicles, equipment, bird containers and staff require particular attention. (Refer to chicken meat sector for details).
- In house or contracted special teams usually carry out cleaning and sanitising. (Refer to chicken meat sector for details).
- DOC delivery vehicles, containers and drivers. The containers and sometimes the drivers go into sheds.
- Feed delivery vehicles and drivers (refer to feed section).
- Dead bird collection vehicles and containers
- Litter disposal vehicles

There are some farms containing FR birds operating within some integrations: (This section should be read in conjunction with the main section on FR farms)

These farms present similar biosecurity problems to those described under the general section on FR. However there are a number of factors that reduce the risk to those operating within an integration:

- The different age groups of birds on any one farm are usually kept separate.
- The higher turnover makes it easier to depopulate farms more frequently.
- The disease status of the other farms visited by the catching team will be known.

Farms including FR and organic farms outside the integrated sector

3.8.8 These farms will vary considerably in size.

3.8.9 DOC placements are variable, they may arrive over a short period or they may even be placed on a weekly basis. In some cases they will receive young birds that have been brooded on another farm, as they do not have brooding facilities.

3.8.10 The timing of the removal of birds for slaughter varies considerably from farm to farm. The pattern may be similar to that of integrated farms or may involve removal on an almost daily basis.

3.8.11 The Christmas trade results in a skewed DOC placement and slaughter program. The on farm numbers rise significantly in the second half of the year and virtually disappear in early December to re-emerge at a low level in the New Year.

3.8.12 Separation of the FR flocks might be say a field or in some instances a simple wire fence.

3.8.13 Some of these farms may be depopulated on a broadly similar timescale to integrated farms others about once a quarter and some never.

3.8.14 Main Risk Factors

- The risks posed by catching teams are the same as those described above. They may in some instances be exacerbated by

the fact that they visit farms owned by a large number of operators and a vehicle and team may occasionally visit several farms under different ownership and control on a single day. Occasionally a vehicle may even pick up birds from two or more farms under different ownership on the same load.

- In those cases where cleaning and sanitising teams are used the risk is the same as that described above, however in many cases farmers will carry out this function themselves.
- On some units feed and water might be supplied outside the sheds, this as far as I can ascertain is actively encouraged in the organic sector. I am given to understand that the organic sector also favours the presence of open water on range. These practices are extremely high risk.
- Pools of open water will be present on many ranges especially after it has rained and some range areas will in any case contain ponds and streams.
- Even where these practices are not encouraged wild birds have access to sheds. They will of course also be attracted by the presence of food.
- The turkeys will inevitably have direct and indirect contact with wild birds and their faeces.
- Local non-migratory wild birds including game birds also present a risk as indirect vectors.

3.9 Suppliers to the ethnic market and small abattoirs

3.9.1 This sector is also known as the independent sector. Although much smaller it would be broadly similar to the chicken meat sector.

3.10 Bird movements

3.10.1 DOC placements are variable, they may arrive over a short period or they may be placed over an extended period.

3.10.2 Thinning of birds would be widely practiced and on average the period between the first and last birds being slaughtered in a shed would be longer than on integrated farms.

3.10.3 The crucial difference between these farms and integrated farms is that on any given day birds from a farm and even from a single shed may be supplied to several different abattoirs owned by different operators. This will in some but not all cases involve catching teams and vehicles under more than one ownership.

3.10.4 Main Risk Factors

All the risk factors that apply to farms operating within an integration plus the following are applicable:

- Routine veterinary advice on issues such as biosecurity and disease prevention will vary from farm to farm and may in a few cases be non-existent.
- There is less incentive for the abattoir owner to reduce the risk of disease spreading from abattoir to farm as it would be uncommon for the owner to own the turkey farm or even have a long term contract or supply the DOC and feed.
- Catching teams and vehicles will be visiting a range of farms and abattoirs.

3.11 Feed Mills

3.11.1 This sector is broadly similar to that of the chicken meat sector although not as integrated or as well organised presents the same concerns.

3.11.2 Main Risk Factors

- Contamination of feed delivery vehicles.
- Contamination of badly stored raw materials.

3.12 Abattoirs

3.12.1 The classification of white meat abattoirs by the MHS is not consistent throughout the UK; this makes it difficult to arrive at a precise figure for mixed turkey abattoirs. I am satisfied however that the figures are sufficiently robust for the purposes of this exercise.

3.12.2 As far as I can ascertain from the MHS register there are fifteen abattoirs in the UK that slaughter turkeys exclusively of which six are FT and nine LT abattoirs. There are also forty one mixed throughput abattoirs of which twenty are FT and nineteen LT.

3.12.3 The abattoirs in the integrated sector are run in a reasonably biosecure manner within the limits already mentioned in the chicken meat section. In the independent sector many are run in a reasonably biosecure manner, unfortunately there are a few that are not. Those operations that rely on multiple sourcing and slaughter

several species also require higher standards of biosecurity than those in a tightly integrated operation.

3.12.4 Birds supplied to some of these operations have long journey times and may also hold birds overnight. They may collect from more than one farm per single vehicle trip. These factors need to be considered in any risk assessment.

3.13 By-product disposal

3.13.1 Large quantities of different types of offal and feathers are produced and have to be disposed of.

3.13.2 Disposal has been much more tightly controlled in recent years. However even material that is going for destruction could present a risk, as it has to be transported to the relevant treatment plant.

3.13.3 Depending on market requirements and the vagaries of trade restriction some products have an export market, others might go for pet food and others have to be destroyed. These markets are not stable and the methods of disposal of these by-products vary from time to time.

3.13.4 Main Risk Factors

- In the integrated sector risk is reduced by accurate knowledge of the disease situation of the farms within the organisation, cleansing and disinfecting of catching vehicles etc, well co-ordinated biosecurity and the common interest of the parties involved.
- Catching vehicles, catching equipment and catching teams
- As the diagnosis of LPAI could easily be missed the risk of LPAI infected birds spreading LPAI via abattoirs through the catching process must be considered. Especially in the case of any birds on FR or Christmas turkeys in insecure accommodation. Mixed species abattoirs that include ducks or geese and other poultry could be the greatest risk of all.
- The disposal of offal particularly the transport of raw offal can present a risk

Disposal of waste from all sectors

3.14 Disposal of used litter

3.14.1 Litter is currently disposed of in several ways. It may be burnt in a power station, spread on agricultural land or composted. This only presents a risk if LPAI has gone undiagnosed in the flock that had been housed on the litter.

3.15 Disposal of dead birds

3.15.1 The regulations state “Dead birds must be held in vermin proof containers until appropriate disposal, either off or on site in line with the Animal By-Products Regulations, can be effected.” The only question is can they be effectively policed.

3.15.2 Clearly any collection system that goes from site to site and takes the carcasses to a central collection point presents some level of risk however carefully managed if LPAI has gone undiagnosed.

3.16 Disposal of hatchery waste

3.16.1 The waste consists mainly of unhatched eggs and a small number of dead culled chicks. The waste is often macerated before disposal.

3.16.2 The bulk is transported in closed skips and usually disposed of by offsite incineration.

3.16.3 The culled chicks are sometimes sold to owners of raptors including zoos.

CHAPTER IV

4.1 Duck Industry structure

4.1.1 The industry is divided into the primary breeding sector and the production sector. The primary breeding sector will be dealt with separately from the production sector. For the purposes of this report the production sector will range from parent stock (PS) to the abattoir and the primary breeding sector from pedigree to PS. However because of joint ownership the distinction between the primary breeding sector is not as distinct as in the chicken and turkey meat sector resulting in overlap at PS level.

4.2 Primary Breeding Sector

4.2.1 One of the largest international breeding companies is based in the UK. It is owned by an integrated UK duck producer. There are a few other smaller less sophisticated breeding companies that essentially produce for the local market, some of these would also be owned by integrated production companies. The numbers of primary breeding stock are commercially confidential.

4.2.2 Although the absolute number of pedigree type stock used for breeding is small the number of day old pedigree stock produced, although small in absolute terms, is relatively large as the percentage of pedigree birds selected for breeding is very small.

4.2.3 The main selection takes place at an age that would allow the rejected birds to be sold for meat. This is a by-product and because many of the breeding companies also belong to integrated production companies their biosecure disposal is easier to organise than in the chicken and turkey sectors.

4.2.4 Pedigree stock are kept on biosecure farms. Their eggs are hatched and their progeny then goes on to become the GP generation, their eggs are in turn hatched to produce PS that passes to the production sector.

4.2.5 Main Risk Factors

4.2.6 They are the same as those for the different production sectors described below. However because of the higher unit value of the stock, the smaller number of birds involved there is the incentive and time to apply an exceptionally high level of biosecurity.

4.3 Production Sector

4.3.1 Parent Stock

4.3.2 There are approximately one hundred and fifty thousand PS on the ground at any time. The average flock size is two thousand females.

4.3.3 The placement or purchase of PS is planned and contracted well in advance. In the vast majority of cases it is based on the requirements of the abattoir for finished ducks. Parent flocks are mainly either owned by integrated broiler companies or hatcheries or contracted to them on a long-term basis.

4.3.4 More than one flock may be housed on a farm at any one time, in the overwhelming majority of cases each flock is kept as a separate biosecure unit and, if reared on a rearing farm, is moved to a production unit(s) in its entirety.

4.3.5 Main Risk Factors on Rearing Farms

- Vaccination teams.
- Vehicles, containers and catching teams used to transport birds to production units.
- Additional risk factors are listed in the section on broiler growing.

The majority of POL birds are placed on specialist production farms until they are sent for slaughter (depleted). More than one flock may be housed on a farm at any one time, but in the overwhelming majority of cases each flock is kept as a separate unit and is usually depleted in its entirety.

4.3.6 Main Risk Factors on Production Farms

- Vaccination teams if vaccination not completed during rearing.
- HE collection vehicles, equipment, packaging material and staff.
- Weekend relief staff.
- Vehicles, containers and catching teams used to transport birds to abattoir if there is more than one flock on a farm.
- Vehicles, equipment and staff of the cleaning and disinfecting team if there is more than one flock on a farm.
- Flocks may share a site with fattening birds or be in very close proximity to a fattening site.

- The housing is not always secure.
- Additional risk factors are listed in the section on broiler growing.

4.4 Hatchery

4.4.1 There are nine hatcheries, producing nineteen million DO ducklings per annum. The overwhelming majority of the production goes through the few larger hatcheries owned by the integrated companies.

4.4.2 Based on a hatchability of 75% a hatchery, producing say two hundred and fifty thousand DO ducklings per week and an incubation period of twenty eight days, would have 1.3 million eggs in the incubator of which, based on the ducklings emerging from the shell over the final two day period in a hatchery hatching four days per week, approximately sixty thousand would be immature DO ducklings. In addition there could be an additional sixty thousand DO ducklings waiting to be dispatched on hatch days.

4.4.3 Depending on the size of the egg bank there could easily be over three hundred thousand HE, which is a week's supply, in storage.

4.5 HE and DOC movements

4.5.1 HE would generally be collected on a weekly or twice weekly basis from parent farms.

4.5.2 Apart from producing enough for their own needs most hatcheries owned by integrators would tend to produce for outside customers as well.

4.5.3 In the event of a shortage or surplus there would be both HE and DO duckling movement between companies.

4.5.4 The independent sector also imports DO ducklings from France and Denmark.

4.5.5 DOC ducklings are usually delivered, within twenty four hours of being hatched, directly to fattening farms. A delivery vehicle may deliver to more than one farm per trip.

4.5.6 Main Risk Factors

- HE and DO duckling collection and delivery vehicles and containers can become contaminated during farm-to-farm deliveries and collections if not effectively cleaned and sanitised.
- Drivers not following biosecurity procedures.
- Imports of HE and DO ducklings arriving in contaminated vehicles and containers.
- Disposal of non-hatching eggs, unhatched eggs, cull ducklings and contaminated packaging materials.

4.6 Fattening sector

4.6.1 Approximately nineteen million DO ducklings are produced annually.

4.6.2 Based on information supplied by the industry farms hold anything from one to a hundred and fifty thousand ducks per crop. Farms would have approximately six crops per annum.

4.6.3 The vast majority of ducks are housed, however not all the housing is secure.

4.7 Bird Movement

Farms containing housed ducks operating within an integration

4.7.1 The vast majority of farms will either be owned by the integrator or be tied to the integrator by tight long-term contracts that would usually involve the supply of DO ducklings.

4.7.2 DO ducklings will arrive over a short period of time and for practical purposes be regarded as a single placement.

4.7.3 Ready to market birds will be removed to slaughter to one or more abattoirs owned by the company. There is however a low level of exchange of birds between different companies.

4.7.4 The majority of ducks are slaughtered at approximately forty nine days of age.

4.7.5 A significant percentage of farms are not all in all out. Furthermore brooding in one section of a shed and moving the brooded birds to a growing section of the same shed is still common practice on many

units. It is also not uncommon to put a new flock of DO ducklings into the brooding section before the growing section is emptied.

4.7.6 **Main Risk Factors**

- Catching vehicles, equipment, bird containers and staff require particular attention. (Refer to chicken meat sector for details).
- In house or contracted special teams usually carry out cleaning and sanitising. (Refer to chicken meat sector for details).
- DO duckling delivery vehicles, containers and drivers. The containers and sometimes the drivers go into sheds.
- Feed delivery vehicles and drivers (refer feed section).
- Dead bird collection vehicles and containers.
- Litter disposal vehicles.

There are a small number of farms containing FR birds operating within some integrations. (This section should be read in conjunction with the main section on FR farms)

These farms present similar biosecurity problems to those described under the general section on FR. However there are a number of factors that reduce the risk to those operating within an integration:

- The different age groups of birds on any one farm are usually kept separate.
- The higher turnover makes it easier to depopulate farms more frequently.
- The disease status of the other farms visited by the catching team will be known.

FR farms including organic farms outside the integrated sector

4.7.7 DO duckling placements are variable, they may arrive over a short period or they may even be placed on a weekly basis. In some cases they will receive young birds that have been brooded on another farm, as they do not have brooding facilities.

4.7.8 The timing of the removal of birds for slaughter varies considerably from farm to farm. The pattern may be similar to that of integrated farms or may involve removal on an almost daily basis.

4.7.9 Separation of the flocks might be say a field or in some instances a simple wire fence.

4.7.10 Some of these farms may be depopulated on a broadly similar timescale to integrated farms, others about once a quarter and some never.

4.7.11 **Main Risk Factors**

- The risks posed by catching teams are the same as those described above. They may in some instances be exacerbated by the fact that they visit farms owned by a large number of operators and a vehicle and team may frequently visit several farms under different ownership and control on a single day.
- In those cases where cleaning and sanitising teams are used the risk is the same as that described above, however in many cases farmers will carry out this function themselves.
- On some units feed and water might be supplied outside the sheds, this as far as I can ascertain is actively encouraged in the organic sector. I am given to understand that the organic sector also favours the presence of open water on range. These practices are extremely high risk.
- Pools of open water will be present on many ranges especially after it has rained and some range areas will in any case contain ponds and streams.
- Even where these practices are not encouraged wild birds have access to the sheds and will be attracted by the presence of food.
- The ducks will inevitably have direct and indirect contact with wild birds and their faeces.
- Local non-migratory wild birds including game birds also present a risk as indirect vectors.

4.8 **Suppliers to the ethnic market and small abattoirs**

This sector is also known as the independent sector.

4.8.1 **Bird movements**

4.8.2 In this sector farms vary from medium size with reasonable buildings to small with small dilapidated buildings. Biosecurity standards will vary from reasonable to almost nonexistent.

4.8.3 DO duckling placements are variable, they may arrive over a short period or they may be placed over an extended period.

4.8.4 Thinning of birds would in some instances be practiced and on average the period between the first and last birds being slaughtered in a shed could be quite an extended one.

4.8.5 The crucial difference between these farms and integrated farms is that on any given day birds from a farm and even from a single shed may be supplied to several different abattoirs owned by different operators. This will in some but not all cases involve abattoir vehicles under more than one ownership and perhaps a vehicle visiting more than one farm.

4.8.6 **Main Risk Factors**

All the risk factors that apply to farms operating within an integration plus the following:

- Routine veterinary advice on issues such as biosecurity and disease prevention will vary from farm to farm and may in some cases be non-existent.
- Some but not all of the abattoir owners have a limited knowledge of disease or disease transmission and biosecurity.
- Catching teams and vehicles will be visiting a range of farms and abattoirs that have no mutual interest in biosecurity.

4.9 **Feed Mills**

4.9.1 Most operations including the integrated ones buy from independent feed mills.

4.9.2 Refer to the section on feed mills in the chicken meat sector for their relevance to AI.

4.9.3 **Main Risk Factors**

- Contamination of feed delivery vehicles.
- Contamination of badly stored raw materials.

4.10 **Abattoirs**

4.10.1 The MHS records provide no indication of which mixed abattoirs in Scotland, Wales or NI slaughter ducks. The numbers slaughtered in these abattoirs are probably low. In England there are eighteen

mixed abattoirs that slaughter ducks. Six are FT and twelve LT, in reality two of the FT are specialist duck abattoirs that slaughter a few geese as well.

4.10.2 This emphasises the importance of biosecurity as these abattoirs provide a link between ducks and geese on the one hand and chickens and turkeys on the other via their catching vehicles and teams.

4.10.3 While many of these mixed abattoirs are run in a reasonably biosecure manner within the limits already mentioned in the section on broiler growing, there are those that are not. These operations that usually rely on multiple sourcing and slaughter several species also require higher standards of biosecurity than those in a tightly integrated operation.

4.11 By-product disposal

4.11.1 Large quantities of different types of offal and feathers are produced and have to be disposed of.

4.11.2 Disposal has been much more tightly controlled in recent years. However even material that is going for destruction could present a risk, as it has to be transported to the relevant treatment plant.

4.11.3 There are markets in Asia for some by-products such as feet. Depending on market requirements and the vagaries of trade restriction some products have an export market, others might go for pet food and others have to be destroyed. These markets are not stable and the methods of disposal of these by-products vary from time to time.

4.11.4 Feathers used to be heat treated and used in pillows, duvets etc. This market has been destroyed by cheap imports from China and feathers where possible are exported or alternatively destroyed.

4.11.5 Main Risk Factors

- In the integrated sector risk is reduced by accurate knowledge of the disease situation of the farms within the organisation, cleansing and disinfecting of catching vehicles etc, well co-ordinated biosecurity and the common interest of the parties involved.
- Catching vehicles, equipment and crates or modules.
- Catching teams

- As the diagnosis of LPAI could possibly be missed the risk of LPAI infected birds spreading LPAI via abattoirs through the catching process must be considered. Mixed species abattoirs, such as these, that include ducks or geese could be the greatest risk of all.
- The disposal of offal particularly the transport of raw offal can present a risk

Disposal of waste from all sectors

4.12 Disposal of used litter

4.12.1 Litter is currently disposed of by spreading on agricultural land or composted. This only presents a risk if LPAI has gone undiagnosed in the flock that had been housed on the litter.

4.13 Disposal of dead birds

4.13.1 The regulations state: “Dead birds must be held in vermin proof containers until appropriate disposal, either off or on site in line with the Animal By-Products Regulations, can be effected.” The only question is can it be effectively policed.

4.13.2 Clearly any collection system that goes from site to site and takes the carcasses to a central collection point presents some level of risk however carefully managed if LPAI has gone undiagnosed.

4.14 Disposal of hatchery waste

4.14.1 The waste consists mainly of unhatched eggs and a small number of dead culled ducklings. The waste is often macerated before disposal. The bulk is transported in closed skips and usually disposed of by off site incineration.

CHAPTER V

5.1 Goose Industry structure

5.1.1 Primary breeding sector

There is no primary breeding sector in the UK.

5.1.2 Production sector

The goose industry is not integrated.

5.1.3 Parent stock and hatchery

For all practical purposes there are no PS, nor does hatching occur to any extent in the UK.

5.2 Fattening sector

5.2.1 Approximately one hundred and twenty to one hundred and fifty thousand DO goslings are imported annually from Denmark and France. In the future it is likely that some of this trade will switch to the new EU Member States such as Hungary.

5.2.2 Approximately one hundred thousand geese are slaughtered for Christmas. Allowing for natural mortality it is clear that nearly all the imported goslings are destined for the Christmas trade.

5.2.3 Virtually all geese are reared on FR. This means that there are approximately one hundred thousand on range during the second half of the year and very few in the first half.

5.2.4 The population would virtually disappear in the weeks before Christmas.

5.2.5 Geese would very often be on mixed farms and it would not be uncommon for pigs to be part of the livestock mix.

5.3 Bird movements

- 5.3.1 DO goslings would be delivered to farms with brooding facilities.
- 5.3.2 Once the brooding period is over they would be moved onto FR, some under the same ownership others being sold on.
- 5.3.3 At the end of the growing period they would be collected for slaughter.
- 5.3.4 There is likely to be a certain amount of small scale on farm slaughtering that would not be registered with or controlled by any regulatory authority.

5.3.5 Main Risk Factors

- Pools of open water will be present on many ranges especially after it has rained and some range areas will in any case contain ponds and streams. The type of range favoured for geese will inevitably be attractive to migratory and resident wild water fowl.
- Catching vehicles, equipment, bird containers and staff require particular attention. (Refer to chicken meat sector for details).
- DO gosling delivery vehicles, containers and drivers.
- Feed delivery vehicles and drivers. (Refer to feed section for details).
- Dead bird collection vehicles and containers.
- On many units feed and water is supplied in the open.
- The geese will inevitably have direct and indirect contact with wild birds and their faeces.
- Local non-migratory wild birds including game birds also present a risk as indirect vectors.
- Routine veterinary advice on issues such as biosecurity and disease prevention will vary from farm to farm and may in a few cases be non-existent.
- Some but not all of the abattoir owners have little or no knowledge of disease or disease transmission and biosecurity.
- Catching teams and vehicles will be visiting a range of farms and abattoirs that have no mutual interest in biosecurity.

5.4 Feed Mills

5.4.1 Feed would be purchased from independent feed mills.

5.4.2 Refer to the section on feed mills in the chicken meat sector for their relevance to AI.

5.4.3 Main Risk Factors

- Contamination of feed delivery vehicles.
- Contamination of badly stored raw materials.

5.5 Abattoirs

5.5.1 The MHS records provide no indication of which mixed abattoirs in Scotland, Wales or Northern Ireland slaughter geese. The numbers slaughtered in these abattoirs are probably low. In England there are eleven mixed abattoirs that slaughter geese. Five are FT and six LT.

5.5.2 This emphasises the importance of biosecurity as most of these abattoirs provide a link between ducks and geese on the one hand and chickens and turkeys on the other via their catching vehicles and teams.

5.5.3 While many of these mixed abattoirs are run in a reasonably biosecure manner within the limits already mentioned in the section on broiler growing, there are those that are not. These operations that usually rely on multiple sourcing and slaughter several species also require higher standards of biosecurity than those in a tightly integrated operation.

5.6 By-product disposal

5.6.1 Different types of offal and feathers are produced and have to be disposed of.

5.6.2 Disposal has been much more tightly controlled in recent years. However even material that is going for destruction could present a risk, as it has to be transported to the relevant treatment plant.

5.6.3 There are markets in Asia for some by-products such as feet. Depending on market requirements and the vagaries of trade restriction some products have an export market, others might go for pet food and others have to be destroyed. These markets are not

stable and the methods of disposal of these by-products vary from time to time.

5.6.4 Feathers used to be heat treated and used in pillows, duvets etc. This market has been destroyed by cheap imports from China and feathers where possible are exported or alternatively destroyed.

5.6.5 **Main Risk Factors**

- Catching vehicles, catchers and crates or modules.
- As the diagnosis of LPAI could easily be missed the risk of LPAI infected birds spreading LPAI via abattoirs through the catching process must be considered. Mixed species abattoirs, such as these, that include ducks or geese could be the greatest risk of all.
- The disposal of offal particularly the transport of raw offal can present a risk.

Disposal of waste from all sectors

5.7 Disposal of manure

5.7.1 In most instances any manure that is retrievable would be used as manure on the farm on which it is produced.

5.8 Disposal of dead birds

5.8.1 The regulations state: “Dead birds must be held in vermin proof containers until appropriate disposal, either off or on site in line with the Animal By-Products Regulations, can be effected.” The only question is can it be effectively policed.

5.8.2 Clearly any collection system that goes from site to site and takes the carcasses to a central collection point presents some level of risk however carefully managed if LPAI has gone undiagnosed.

ABBREVIATIONS

ACP	Assured Chicken Production
AI	Avian Influenza
BEIC	British Egg Industry Council
BPC	British Poultry Council
DOC	Day old Chicks
DO	Day Olds
FF	Farm Fresh
GP	Grandparent Stock
GGP	Great Grandparent Stock
FT	Full Throughput Abattoirs
FR	Free Range
HE	Hatching Eggs
HPAI	High Pathogenic AI
LPAI	Low Pathogenic AI
LT	Low Throughput Abattoirs
MHS	Meat Hygiene Service
POL	Point of Lay
PS	Parent Stock
QA	Quality Assurance
QBT	Quality British Turkey