Compassion in World Farming Trust

THE WELFARE OF BROILER CHICKENS IN THE EUROPEAN UNION

A report by
Compassion in World Farming Trust
distributed in association with
The European Coalition for Farm Animals
2005

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Compassion in World Farming Trust

Compassion in World Farming Trust is an educational charity working internationally to advance the welfare of farm animals. We carry out detailed research using academic literature and publish educational resources for use by schools, universities and the general public on farm animal welfare and associated environmental, social and ethical issues. Our publications include reports, books, videos, factsheets and teaching materials.

CIWF Trust cooperates with organisations and individuals in many countries. Our current key issues include animal sentience and an assessment of the impact of the World Trade Organisation on farm animal welfare globally. The Trustees are grateful to several grant-making Charitable Trusts and members of the public who have made work in these areas possible. A complete list of our available materials and downloadable versions can be found at www.ciwf.org

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Registered Charity number, 1095050, a company limited by guarantee, Registered Number 4590804

ISBN 1 900156 35 0

EXECUTIVE SUMMARY

- Around 5.9 billion broiler chicks are reared for meat in the EU every year. Most are intensively farmed and kept in windowless, barren and crowded sheds holding tens of thousands of birds for the whole of their brief 6 - 7 week lives. Up to 2005, there have been virtually no specific European laws to protect the welfare of broiler chickens.
- The March 2000 report on broiler chicken welfare by the European Union's Scientific Committee on Animal Health and Animal Welfare (SCAHAW) confirms the serious criticisms of the broiler industry that Compassion in World Farming Trust has made for many years. The scientific evidence cited in the Committee's report shows that:
  - Selective breeding for ever faster growth rate and feed conversion efficiency has caused most of the welfare problems broilers suffer from today. Broiler chickens have a mortality rate of 1% a week, seven times the rate of laying hens of the same age.
  - Because they grow too fast, millions and possibly tens of millions of EU broiler chickens a year suffer from painful lameness due to abnormal skeletal development or bone disease, so that many have difficulty in walking or even standing. Lame broilers spend up to 86% of their time lying down. They may be unable to reach up to their drinking water containers and can go without water for several days.
  - In one heavy strain of broilers, over 47% have been found to have tibial dyschondroplasia, a disorder of bone growth, in their legs. A 1999 survey in Denmark found that over 30% of the broilers studied were limping or severely lame and that there was development of dyschondroplasia in 57% of chicks. A 2002 survey in Sweden found that 72.4% of broilers had a walking abnormality and 1 in 5 were so lame that they had some difficulty in moving around. The SCAHAW Report says that: 'Leg disorders are a major cause of poor welfare in broilers' (SCAHAW, 2000, Conclusions 6).
  - The breeding companies give low priority to reducing lameness in their breeding programs. In 2000, the SCAHAW concluded that up to now any attempt the breeding companies may have made to reduce leg problems 'has not improved welfare' (SCAHAW, 2000, Conclusion 3).
  - As a result of selective breeding, broiler chickens' hearts and lungs often cannot keep up with their bodies' fast growth rate. They frequently suffer from heart failure when they are only a few weeks old. Acute heart failure known as Sudden Death Syndrome kills 0.1% to 3% of broilers in European countries. A second form of heart failure known as ascites affects nearly 5% of broilers worldwide. Using UK industry figures, nearly 130 million broilers may die in the EU from heart failure annually.
  - High stocking density in broiler sheds restricts the broiler chickens' behaviour and causes health problems. It leads to increases in lameness, breast blisters, foot-pad dermatitis, hock burns and infections. Crowded broiler sheds lead to wet litter, increased air pollution from ammonia and dust particles and poor temperature and humidity control, all of which damage the broilers' health and welfare.

According to the SCAHAW Report, the stocking density should be no higher than 25 kg / m^2 (12.5 birds per square metre) 'for major welfare problems to be largely avoided'. Above 30 kg / m^2 (15 birds per square metre) there is a 'steep rise in the frequency of serious problems'. Stocking densities used in Europe are typically much higher than SCAHAW's recommendations. In the UK, the government's recommended limit has been routinely exceeded.

- Broilers that are allowed to grow to adulthood to be used for breeding are restricted to between one fifth and one half of the amount of food they want to eat during their growing period and 'appear to be chronically hungry, frustrated and stressed'. Less severe feed restriction (up to 50%) may be continued in adulthood. The Committee says that these breeding birds are 'very hungry', resulting in 'unacceptable welfare problems' and that their welfare 'must be improved' (SCAHAW, 2000, Conclusions and Recommendations).
- Catching the birds when they are removed from the shed for slaughter 'can result in unacceptably high levels of bruises, fractures and other traumatic injury, as well as high stress levels' (SCAHAW, 2000, Sect. 7.8, conclusion). Across the EU, the annual number of broilers that die during the process of catching, packing into crates and transport may be as high as 18 - 35 million. In the UK, 40% of broilers that are 'dead on arrival' at the slaughterhouse may have died from thermal stress or suffocation, due to crowding on the transporter.
- The slaughter process, when the conscious broilers are hung upside down in 'shackles' and stunned by dipping in electrified water baths, is also cause for concern. Broilers often experience pain and struggle while hung in shackles, and they may suffer during the slaughter process. Over 50 million EU broilers yearly may be slaughtered while not fully unconscious. It is essential that sufficient stunning current is used and that both carotid arteries are cut to reduce the risk of birds regaining consciousness during bleed-out.

- **The scientific evidence shows clearly that the intensive broiler chicken industry inflicts serious health and welfare problems on the birds. The industry's drive to ever faster growth rates leads to painful leg disorders and heart failure in the birds reared for their meat and to severe food restriction and hunger in the breeding birds. In addition, the birds are often housed in sheds that are too crowded and that subject them to suffering from skin sores, uncomfortably high temperatures and unhealthy levels of air pollution.**
- **Compassion in World Farming Trust believes that urgent action is now essential to address the serious health and welfare problems of intensively farmed broiler chickens.**

CONTENTS

1.0 INTRODUCTION: WELFARE IN THE BROILER INDUSTRY

Broiler chickens (often called 'broilers') are the specialised type of chicken reared and eaten for their meat. Around 5.9 billion chickens for eating are produced yearly in the European Union (EU25). Mass production of chicken meat is a global industry and two or three breeding companies supply around 90% of the world's breeding broilers. The total number of meat chickens produced in the world was nearly 47 billion in 2004, according to the FAO; of these approximately 19% were produced in the US, 15% in China, 13% in the EU25 and 11% in Brazil (FAO, 2004). Chicken meat costs less than other meats and this has rapidly increased its market share.

In 2004 in the European Union (EU25) the number of chickens farmed for meat was highest in France, followed by Spain, the UK, the Netherlands, Germany, Poland and Italy. Consumption of poultry meat in Hungary, the Czech Republic, Slovenia and Slovakia was also among the highest in Europe in 2002. Chicken consumption in Europe has increased compared to that of other meat; between 1985 and 2003 the production of chicken meat in the countries of the EU15 increased by 42% - while the production of all meat increased by 16% (FAO, 2004). Chicken meat consumption grew at about 2.6% a year during the 1990s in Europe and reached 17% of all meat consumption in the EU (SCAHAW, 2000, sects. 5 and 10). To meet this demand, the EU is expected to increase both its production within the EU and the import of poultry meat (FAS USDA, 2001). Imports of chicken from non-EU countries, especially from Brazil and Thailand, are increasing, and competing with EU production. The welfare standards for chickens in some non-EU countries may be even lower than those of the EU.

The welfare of the chickens in Europe and around the world that supply this increasing demand has been a matter for great concern for at least a decade. Broiler chickens are slaughtered for meat typically at around 6 weeks of age but even before then they suffer from high rates of painful lameness. This is mainly because they are selectively bred to grow so fast that their legs cannot support their rapidly increasing body size. Broilers also have high rates of heart disease (again because they grow so fast). They are often kept in overcrowded conditions that can damage their health and they often develop skin sores. A scientific survey at the beginning of the 1990s from the University of Bristol found that almost 26% of broiler chickens were probably suffering chronic pain and discomfort in the last weeks of their lives as a result of lameness (Kestin *et al.*, 1992). In 1992, the UK Farm Animal Welfare Council's working party on the welfare of broiler chickens stated that they had found leg problems of varying degrees of severity on nearly every farm visited and that the worst affected birds were only able to move with great difficulty, using their wings to balance (FAWC, 1992).

The scientific evidence suggests there has been no real improvement in the welfare of broiler chickens in the EU since 1990 - in some respects welfare has even

deteriorated as production has increased. In March 2000 SCAHAW published a detailed 150-page report on broiler chickens, citing over 500 references. This report points to numerous flaws in the current welfare situation and lack of progress by the industry in tackling well-documented welfare problems. In particular, the report highlights the health and welfare problems caused by selective breeding for fast growth and it states clearly that the resultant metabolic disorders resulting in leg problems and heart failure are 'major concerns for animal welfare' (SCAHAW, 2000, Conclusions 4).

SCAHAW called for important changes in breeding and management and for continuous, objective monitoring of progress (SCAHAW 2000, Recommendations).

In 1997, a legally binding Protocol was added to the European Treaty, the basis of EU law, recognising that animals are sentient beings, that is, they are living creatures capable of feeling pain and suffering. The Protocol also states that 'the Community and Member States shall pay full regard to the welfare requirements of animals' (Treaty of Amsterdam, 1997). Compassion in World Farming Trust believes that urgent reforms in broiler farming are needed in order to recognise, in practice, the sentience of broiler chickens.

Compassion in World Farming Trust believes that the EU should act on SCAHAW's report with the aim of creating a rapid improvement in the health and welfare of broiler chickens. The industry needs to reverse the relentless march of intensification over the last decades. At the very least this must mean a significant reduction in the broilers' growth rate and in the stocking density in chicken houses.

2.0 OVERVIEW OF BROILER CHICKEN FARMING

2.1 Fast growth rates

Standard intensively farmed broiler chickens are reared to their slaughter weight (typically around 2 kg, sometimes 3 kg) very rapidly. They reach slaughter weight of 2 kg within about 40 days of being hatched, whereas they would not reach adulthood until about five or six months. Broilers are thus very young animals for the whole of their rearing period. By selective breeding, the length of time broiler chicks take to grow to 2 kg has been halved in the last 30 years and between 1976 and 2007 it is likely to have been reduced by 1 day every year. The amount of feed needed to achieve this weight gain has been reduced by almost 40% since 1976. Meanwhile, breeding for increased breast muscle means that the broilers' centre of gravity has moved forward and their breasts are broadened compared to their ancestors, which affects the way they walk and puts additional stresses on their hips and legs (SCAHAW, 2000, Sect. 4.2). Broilers have become very inactive. At just 6 weeks old, they spend 76%-86% of their time lying down (Weeks *et al*., 2000). They have a mortality rate 7 times that of young laying hens of the same age (SCAHAW, 2000, Sect. 5.4).

Painful lameness is a major welfare concern in broiler chickens

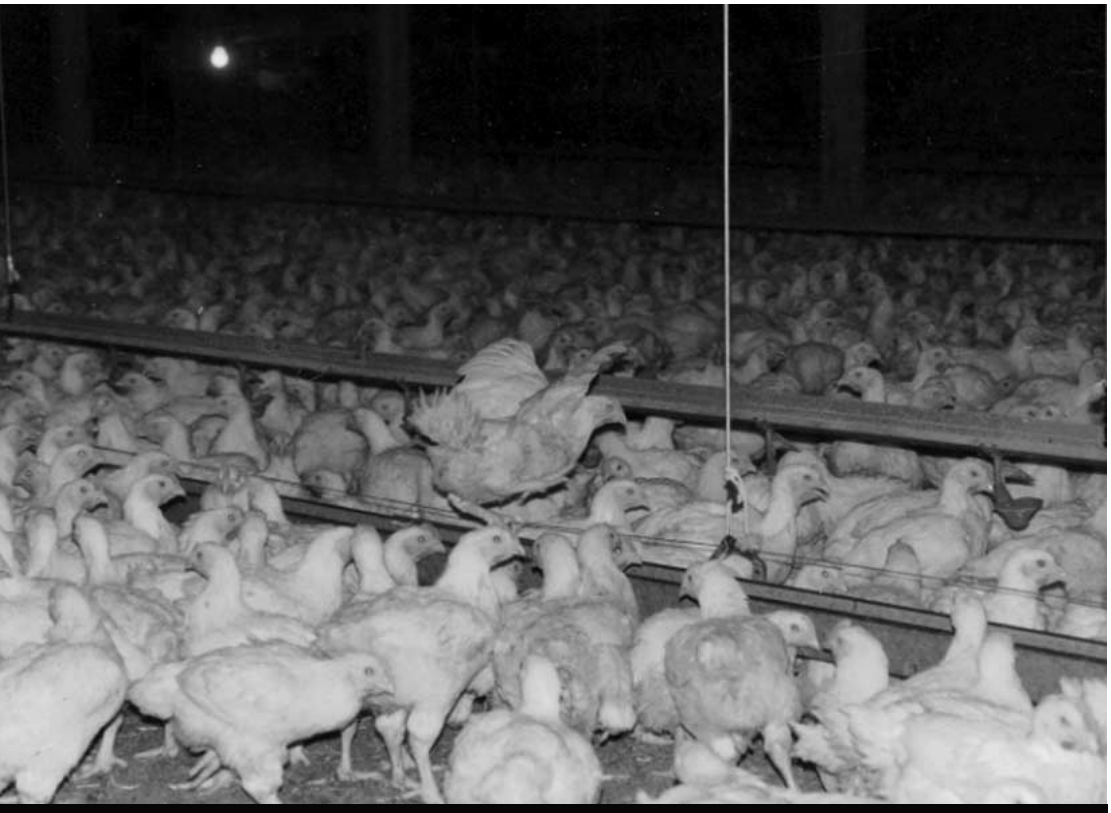
2.2 Stocking density

In the EU, intensively farmed broilers are housed indoors in large sheds containing thousands or tens of thousands of birds. The sheds are often windowless and force-ventilated to control temperature and are barren except for litter material (wood shavings, straw, etc.) on the floor and rows of feeders and drinkers. When the chickens are at their maximum weight before slaughter the sheds are often very crowded and, according to the SCAHAW report, this can lead to restricted movement and increased disease.

Typical stocking densities in Europe range between about 22 and 42 kg / m² or between about 11 and 25 birds per square metre (SCAHAW, 2000, sect. 5.1). Although (in 2005) some EU countries have legal or recommended limits on stocking density, in practice these limits may still allow the chickens little space. For example, the German Federal government recommends limits of 30 and 37 kg / m², depending on management conditions. Sweden has a limit of 20 kg / m², which is increased to 36 kg / m² if the farm satisfies a welfare scoring system (Bessei, 2004). Danish legislation came into force in January 2002 to reduce maximum stocking density from 44 kg / m² during 2002 to 40 kg / m² by the beginning of 2006 (Danish Ministry of Justice, 2001). Where there are only recommended limits, actual stocking densities are often much higher. For example, the Assured Chicken Production scheme set up in the UK allows stocking densities up to 38 kg / m², considerably higher than the UK government's recommendation of 34 kg / m² (Assured Chicken Production, 2005).

2.3 Catching, transport and slaughter

At the end of their lives of typically 6 to 7 weeks, the broilers are caught and packed live into crates for transport to the slaughterhouse. They are deprived of food and water for some hours before catching until slaughter. The process of catching, loading, transport and unloading causes serious injury and even death to a significant number of broilers. Slaughter is done by hanging the birds fully conscious by their feet, stunning them in an electrified water bath and then cutting their throats.



High stocking density restricts chickens' ability to perform natural behaviour

3.0 SELECTIVE BREEDING AND FAST GROWTH

A 1998 review of the health effects of selective breeding of farm animals concluded:

> Animals in a population that has been genetically selected for high production efficiency seem to be more at risk for behavioural, physiological and immunological problems (Rauw *et al*., 1998).

According to SCAHAW, it is clear that the major welfare problems in broilers are those which can be regarded as side effects of selection. The main aims of the selection are to increase growth rate and to reduce the amount of food needed to achieve that growth rate (usually expressed as Feed Conversion Ratio). The Committee puts it:

> Most of the welfare issues that relate specifically to commercial broiler production are a direct consequence of genetic selection for faster and more efficient production of chicken meat, and associated changes in biology and behaviour (SCAHAW, 2000, Conclusions 2).

What this means is that the modern broiler's body puts all its resources into the two tasks of growth and feed conversion, rather than achieving balanced growth and bodily maintenance. SCAHAW concludes:

> It is obvious that rapid growth which is the result of genetic selection and intensive feeding and management systems is the main cause of various skeletal disorders and metabolic diseases that have become important causes of mortality (SCAHAW, 2000, 6.1.3).

Selectively bred broiler chickens tend to suffer from painful lameness, from various forms of heart disease and have much higher death rates than slower growing poultry breeds. SCAHAW says that 'a good illustration' of the effect of selective breeding for high growth rate is a comparison of the usual mortality rate for standard broiler chickens (1% per week) with that for slower-growing broiler chickens (0.25% per week) and with young laying hens (0.14% per week) (SCAHAW, 2000, Sect. 5.4).

Birds bred for large appetites and rapid growth have difficulty surviving into adulthood. An experiment on broilers' food intake from the Roslin Institute in the UK found that a shocking 20% of birds allowed to eat as much as they wanted either died or had to be killed because of severe illness between 11 and 20 weeks of age - either they became so lame they could not stand or they developed heart failure (Savory, Maros and Rutter, 1993). According to a 2003 review of the evidence by experts,

> Since the early 1950s, poultry breeding has focused on increasing profitability, with little regard for the effect on the skeletal, respiratory or cardiovascular systems or the well-being of the bird (Whitehead et al, 2003).

3.1 The role of the breeding companies

The question arises as to the responsibilities of the broiler breeding companies for broiler health and welfare. The criteria that the breeding companies use in their selection processes are 'not public knowledge' (SCAHAW, 2000, Sect. 5.4) but it seems possible that they have responded to a perceived demand for ever more 'efficient' chickens rather than focusing on welfare. A review of broiler breeding in 1996 indicated that selection against leg disorders only came 9th out of 12 factors taken into account by the breeding companies, while the first and second factors

were faster growth and efficient feed conversion (Hardiman, 1996). Certainly SCAHAW believes that the breeding companies have not put enough emphasis on broiler welfare up to now and concludes:

> Broiler chickens are mostly selected for growth rate and food conversion ratio. Other traits such as low frequency of leg disorders or resistance to pathogens are likely to be included in the selection index by most breeders, but the importance given to such traits is often low and *up to now has not improved welfare* (SCAHAW, 2000, Conclusions 3). (Our emphasis).

The Scientific Committee states that its 'most important recommendation' is that the breeding companies need to get rid of the damaging side effects of selection for growth and feed conversion. The Committee recommends that breeders should be responsible for demonstrating that the standards of welfare in the chickens they produce are acceptable and that breeding which causes very poor welfare should not be permitted (SCAHAW, 2000, Recommendations).

A leading animal welfare expert at Bristol University Veterinary Department has commented,

> Since the international broiler industry is dominated by less than five breeding companies..., it would not be difficult in practice to achieve an overall improvement in broiler welfare through a ban on the wholesale commercial production of any strain of bird that failed to meet defined standards with regard to the prevalence of leg disorders or cardiac failure (Webster, 2005).

3.2 Leg problems and lameness

3.2.1 High incidence of lameness

In the early 1990s scientists at Bristol University Veterinary Department developed a 'gait score' (GS) method to rate the walking ability and lameness of commercial broiler chickens. On this scale, GS 0 indicated normal walking ability, GS 3 indicated an obvious gait abnormality which affected the bird's ability to move about and GS 5 indicated a bird that could not walk at all. GS 5 birds tried to use their wings to aid walking, or crawled along on their shanks. As we have seen, almost 26% of the birds examined at that time were rated as GS 3 or above, and can therefore be considered to have suffered from painful lameness (Kestin *et al*., 1992).

In 2000 SCAHAW reported that:

> Leg disorders are a major cause of poor welfare in broilers. Gait scoring surveys have shown that large numbers of broilers have impaired walking abilities and there is evidence that birds with score 3 or higher experience pain or discomfort (SCAHAW, 2000, Conclusions 6).

In fact, there is evidence that, far from improving, leg problems may have deteriorated further during the 1990s. Large and representative surveys of commercial broiler flocks in Denmark (1999) and Sweden (2002) found that in Denmark, 75% of the chickens had some walking abnormality and 30.1% were very lame (gait score greater than 2). In Sweden, over 72% of the chickens had some walking abnormality and around 20% were very lame. 36.9% of the chickens surveyed in Denmark and around half (46.4% and 52.6%, depending on strain) of the chickens surveyed in Sweden had leg deformities (varus / valgus). 57% of the chickens surveyed in Denmark and around half of the chickens surveyed in Sweden showed some evidence of tibial dychondroplasia (Sanotra, Berg and Lund, 2003).

3.2.2 Pain and dehydration

The fact that lame broilers suffer pain is underlined by experiments reported in the *Veterinary Record* in 1999 and 2000, where broilers were treated with carprofen, an analgesic. In one experiment, healthy birds took 11 seconds to complete an obstacle course, whereas lame birds took 34 seconds. When the birds were treated with carprofen, there was no effect on the healthy birds' speed but the lame birds now took only 18 seconds to traverse the course, suggesting that the pain of lameness had been relieved by the drug (Mc Geown *et al*., 1999). In a second experiment, chickens were allowed to choose between feed that contained carprofen and their normal feed. The lame birds chose to eat more of the feed laced with carprofen. The authors concluded that their results supported the view that:

> lame broiler chickens are in pain and that this pain causes them distress from which they seek relief (Danbury *et al*., 2000).

Even the birds with gait score 1 (the least obvious lameness) chose to eat the carprofen, suggesting that they were in pain even though they were not obviously very lame (Webster, 2005).

When broilers are too lame to stand upright, they may be unable to reach up to their water containers and become dehydrated. A UK study of broilers that had been kept to the age of 84 days (well beyond the 42 days at which intensively farmed broilers are normally slaughtered) found that:

> Many of the lame birds appeared unable to reach bell drinkers (400mm from the litter) and drank avidly when the drinkers were lowered (Butterworth *et al*., 2002).

Analysis of the state of dehydration of the broilers suggested that many of the birds with the most severe lameness may have been unable to drink for more than 100 hours (Butterworth *et al*., 2002).

3.2.3 Causes of lameness

Broilers suffer from three main types of lameness: lameness associated with abnormal bone development, bone and joint diseases associated with infections, and lameness associated with degenerative diseases (Butterworth, 1999).

Abnormal bone development

The diseases caused by abnormal development of leg bones are generally attributed to the fast growth of the broiler chicks, which means that they become too heavy for their legs. The leg bones may be bent either inward or outward or the leg may be twisted. The most common problem of broiler leg bones is tibial dyschondroplasia, involving defective formation of cartilage so that the calcification of the bone does not happen as it should. This disease is much more common in heavy breeds of chicken and has been found to affect over 47% of birds in one commercial strain of broilers (SCAHAW, 2000, Sect. 5.5.3.). As mentioned above (Section 3.2.1), development of tibial dyschondroplasia has been found in between 45% and 57% of broilers surveyed in Denmark and Sweden (Sanotra, Berg and Lund, 2003).

Infectious disease

Femoral head necrosis (or bacterial chondronecrosis) frequently affects broilers towards the end of the growing period, according to SCAHAW. The disease is caused by bacterial infection and can result in the disintegration of the top of the leg bones. The bird becomes severely lame and cannot stand up without support from its wings. Another bacterial or viral disease of joints and tendons is arthritis or synovitis. The birds suffer severe lameness with hot, swollen joints and / or tendons (Butterworth, 1999; SCAHAW, 2000, Sect. 6.2).

Degenerative diseases

Degenerative diseases, such as cartilage loss or osteoarthritis in hip joints and ruptured tendons and ligaments, are more frequent in the broilers kept for breeding who are allowed to grow to adulthood. These problems may be the result of the fast growth of the birds before adulthood (SCAHAW, 2000, Sect. 5.5).

3.2.4 Lameness and selective breeding

The leg problems of broilers are largely the result of selective breeding and could be reversed by the breeding companies. Slower-growing chickens have a lower incidence of lameness than fast-growing strains. A study by Bristol University Veterinary Department, published in *Veterinary Record* in 2001, reported the incidence of lameness in 13 broiler strains including commercial fast-growing hybrids, slower-growing strains suitable for free-range systems and 'traditional' breeds. The study concluded that high growth rate was the most important factor leading to lameness, with the modern genotypes of broiler being less able to walk than the slower-growing birds (Kestin *et al*., 2001). The scientists concluded that their results

Lame broiler chickens are in pain

> [S]upport the hypothesis that the lameness which develops in modern genotypes of broiler is a result of their selection for high liveweights and rapid growth rates, resulting in abnormally high loads being placed on relatively immature bones and joints (Kestin *et al*., 2001).

Although it is generally recognised that many leg problems are caused by the fast growth rate of modern broiler chickens, there are significant differences between the different fast-growing broiler strains. A report in *Poultry Science* in 1999 compared the gait scores of four strains of commercial broilers, most of which are commonly used in the EU and available worldwide. They found that there was a difference of over 0.5 gait score units between two of the broiler strains, even though the weight of the birds was the same. This comparatively large difference was due to genetics alone, whereas changes in husbandry and management have been shown to make only small improvements to leg problems (Kestin, Su and Sørensen, 1999).

The SCAHAW report supports the view that the broiler breeding companies could undoubtedly improve the welfare of broilers by selecting for improved leg strength and walking ability and by reversing the trend towards faster growth rates. There is a wealth of scientific evidence from the EU that slower-growing chickens suffer less from lameness and are more active. A study from Bristol University has showed that chickens from traditional breeds had a gait score of 2.6 units better than the fast-growing hybrids, and the slower-growing commercial hybrids had a gait score 1.1 units better than the fast-growing hybrids (Kestin et al, 2001). Research from Wageningen University also found statistically significant differences between the behaviour of slow and fast-growing meat chickens up to 12 weeks of age. Activities such as walking, pecking while standing,

perching and scratching were performed significantly more often by the slow-growing birds (Bokkers and Koene, 2003). Some European countries, especially France where the 'Label Rouge' system is well established, already have extensive experience with slow growing breeds that are available now (Harn and Middelkoop, 2001). Unfortunately, the broiler breeding companies still aim at producing ever-increasing growth rates (Hardiman, 1996). Scientists from one of the major breeding companies have predicted that by 2007 their broilers will weigh 3.0 kg at 42 days of age (instead of around 2.6 kg in 1999) and that they will grow to 2.0 kg in only 33 days (McKay *et al*, 2000).

Compassion in World Farming Trust is very concerned by the possibility that continued selective breeding will make chickens' leg problems even worse in the future. According to University of Bristol scientists, a predicted increase of over half a kilogram in the broilers' weight by 40 days of age would mean a deterioration in walking ability of 1.1 units of gait score (Kestin, Su and Sørensen, 1999), representing a huge increase in painful lameness. This underlines the urgency of action to reverse the damage already done to broilers by selective breeding.

3.3 Heart failure

Fast-growing broilers suffer from two forms of heart failure, known as ascites and Sudden Death Syndrome (SDS, also known as 'flip-over syndrome'). These conditions are relatively common and are likely to be due to the fact that the broilers' fast growth requires high levels of oxygen to support metabolic demands. All their energy is spent on growth and efficient feed conversion, leaving them short of oxygen for their other bodily needs so that their hearts have to work much harder. The broiler selectively bred and managed for very fast growth has a genetically induced mismatch between its energy supplying organs and its energy consuming organs, according to research cited by SCAHAW (SCAHAW, 2000, Sect. 4.2). SCAHAW concludes that:

> Fast growth rates increase the risk of ascites and SDS by increased oxygen demand of the broilers, which intensifies the activity of the cardio-pulmonary systems (SCAHAW, 2000, Conclusions 10).

Ascites affects fast growing chickens when the right side of the heart becomes enlarged in response to increased workload. The chickens then develop heart failure and changes in liver function, causing fluid to accumulate in the abdominal cavity. The skin of the abdomen may become red and the abdomen becomes swollen with fluid. The bird has to breathe more rapidly and its lungs become congested (Julian, 1990). Nearly 5% of broilers worldwide have this disease, according to a 1996 survey, making it one of the major causes of death in broilers (SCAHAW, 2000, Sect. 6.5.1). UK broiler producers reported a death rate of 1.4% in 1993 (Maxwell and Robertson, 1998). The incidence of ascites has actually increased in recent years, according to SCAHAW (SCAHAW, 2000, Conclusions 9), and is recognised as one of the leading causes of carcase condemnation in modern broiler flocks around the world (Olkowski *et al*., 2001).

SDS has a death rate of 0.1% to 3% in Europe (SCAHAW, 2000, Sect. 6.5.2). UK broiler producers reported an incidence of 0.8% in 1993 (Maxwell and Robertson, 1998). SDS is an acute heart failure disease that affects mainly male fast-growing chickens which seem to be in good condition. The birds suddenly start to flap their wings, lose their balance, sometimes cry out and then fall on their backs or sides and die, usually all within a minute. SCAHAW considers that:

> Even though the apparent time from onset of the syndrome until death is only a matter of minutes, it may still have an important impact on bird welfare (SCAHAW, 2000, Conclusions 10).

Millions of fast-growing broiler chickens die in their sheds from heart failure

Both ascites and SDS are examples of heart failure occurring in young birds only a few weeks old. Their hearts and lungs have been unable to keep up with the fast growth of their body muscle. These are largely preventable diseases caused by breeding and managing broilers for high growth rate and feed conversion, at the expense of their overall health.

A recent Dutch survey of the future of the broiler industry recommended a move towards:

> [broilers] that have been bred less for high growth rates and ... feed conversions, and possibly, because of that, are less susceptible to heart and vascular problems (Harn and Middelkoop, 2001).

3.4 Susceptibility to disease

There is evidence that the selection of broilers for rapid growth and efficient feed conversion has reduced their immunity to disease. Broilers selected for fast growth rate have been found to have lower antibody responses when exposed to infection, according to a 1998 review (Rauw *et al.*, 1998). An experiment on the immune responses of different broiler strains in Israel found that 40% of the fast-growing, heavier broilers died when infected with *Escherichia coli* bacteria, compared to 8% - 20% mortality for slower-growing breeds. The scientists commented that:

> These results indicate that rapid growth rate substantially reduces broiler viability (Yunis *et al.*, 2002).

Fast growth rates are believed to be related also to high incidence of cellulitis in modern broiler farms. Cellulitis is a disease caused by bacteria such as *E.coli* and is characterised by infected scratches on the surface of the skin. In addition, broilers selected for fast growth have been found to have increased susceptibility to various non-infectious diseases (Boersma, 2001).

3.5. Inactivity

Intensively farmed broiler chickens are very inactive. This is likely to be partly because their selective breeding for growth and feed conversion and their heavy weight leave them no spare energy for exercise. It may also be that the crowded conditions in the broiler sheds give them too little room to move around easily. Whatever the reason, there is a striking difference between the activity level of standard broilers and other chickens.

Several studies have shown that broilers do less walking / running or pecking / scratching than laying hens and that they spend more time sitting or resting as they grow. Unlike laying hens, they do very little dust-bathing, wing-flapping and wing-stretching. During their short lifetime they spend over 75% of their time sitting or resting compared to less than 30% spent sitting by laying hens of the same age. The lack of exercise may increase their risk of leg problems and also their risk of hock burns or breast blisters from prolonged sitting or lying on their litter material (SCAHAW, 2000, Sect. 4.2).

Observations of the activity of 6 batches of 100 commercially-reared broilers taken from different farms over a period of 2 years were reported recently from the University of Bristol Veterinary Science Department (Weeks *et al*., 2000). Between 5 1/2 and 7 weeks of age, lame broilers spent 86% of their time lying down (compared to 76% for non-lame broilers). The most lame birds only spent 1.5% of their time walking, made many fewer trips to the food and water and even lay down to eat. The scientists conclude that as a result of selective breeding for efficient feed conversion, broilers have become 'extremely inactive' and that this may be detrimental to their welfare (Weeks *et al*., 2000).

Research in Denmark, France and the Netherlands has found similar evidence. In the Danish study, lameness and tibial dyschondroplasia were found to reduce dust-bathing behaviour and increase the amount of time broilers spent immobile. As the birds grew older and heavier, and leg problems ensued, they spent more time sitting still (Vestergaard and Sanotra, 1999). A French study found that walking activity of chicks from the slow-growing 'Label Rouge' breed was considerably greater than that of chicks from fast-growing breeds. The slow growing chicks explored the litter for three times as long as fast-growing chicks. Towards the end of their lives, fast-growing chickens also spent more time resting and sitting. This reduction in activity is likely to increase the occurrence of lameness (Bizarey, 2000). Slow-growing broilers have also been found to make more use of perches, when they are provided, and are more agile than fast-growing broilers (Wiers *et al*., 2001).

The barren environment of commercial broiler houses also contributes to inactivity. Research by the University of Oxford in the UK showed that providing broilers with straw bales, for environmental enrichment, significantly increased the amount of time the broilers spent standing, walking and running and reduced the amount of time spent sitting and resting (Kells *et al*., 2001).

3.6 Feed restriction and the welfare of broiler breeders

Broiler breeders are the broiler chickens that are allowed to live into adulthood in order to breed and produce the broiler chicks that are reared for meat. They are often kept in specialist breeder farms. Female broiler breeders start laying eggs at around 5 months old and produce up to 140 chicks during their laying lives of around 10 months, after which they are sent for slaughter. Typically 1 male breeder chicken is kept for every 7-10 females. Although the numbers of broiler breeders are of course much fewer than the numbers of broilers bred for meat, the breeders also have serious welfare problems caused by the selection of chickens for fast growth and efficient feed conversion.

While broiler breeders are growing to adulthood their food is severely restricted, leading to chronic hunger. This restriction is carried out to prevent them from growing as fast as the meat broilers, because they are required to survive healthily into adulthood in order to produce chicks. According to a review in *World's Poultry Science Journal* in 2002, they may be fed as little as one fifth of the quantity that they want to eat, and feed restriction of up to 50% may continue during adulthood. The review states that:

> Broiler breeders show evidence of physiological stress as well as an increased incidence of abnormal behaviours, and are also chronically hungry (Mench, 2002).

Broilers are selectively bred to have very large appetites and to reach around 2 kg weight in less than 6 weeks. They are slaughtered well before adulthood. But breeding birds are required to reach similar weights (2.8 kg for females and 3.7 kg for males) only

at sexual maturity around 24 weeks of age. If the females were allowed to eat as much as they wanted, by 24 weeks they would weigh over 6 kg, they would be fat, many would be lame and the death rate from skeletal problems and heart disease would be unacceptably high. Severe food restriction decreases the health problems that are caused by too fast growth. It also minimises food costs and increases fertility (SCAHAW, 2000, Sect. 9.1).

As SCAHAW points out, the breeding industry has created a welfare dilemma for itself. Broilers have been selectively bred to eat enormously but to succumb to obesity, skeletal problems and heart failure after a few weeks of life if they are allowed to eat as much as they want.

There is no doubt that broiler breeders suffer from severe hunger because of the food restriction to which they are subjected. An experiment at the Roslin Institute in the UK found that broilers fed restrictively (according to recommendations for parent broilers by a major breeding company) ate only one quarter to a half as much during their growing period as broilers that were allowed to eat as much as they wanted. Their motivation to feed was almost 4 times as strong as that of fully-fed broilers which had been starved for 72 hours before the motivation tests. The scientists concluded that their results were evidence that:

> restricted-fed broiler breeders are chronically hungry, frustrated and stressed (Savory, Maros and Rutter, 1993).

According to SCAHAW, these broilers were 'highly motivated to eat at all times'. They were found to be equally anxious to feed one hour after their daily meal as they were one hour before it. Feed restricted broilers pace more before meal times and engage in more stereotypic drinking and pecking than fully-fed broilers, which is 'characteristic of frustration of feeding motivation' (SCAHAW, 2000, sect. 9.1). SCAHAW concluded that:

> Substantial evidence indicates that growing birds are very hungry (SCAHAW, 2000, Sect. 9, Conclusions).

SCAHAW suggests that severe feed restriction may be being used by the industry to minimise costs rather than because it is essential for production and it recommends:

> The welfare of breeding birds must be improved. The severe feed restriction needed to optimise productivity results in unacceptable welfare problems... New approaches are needed to the breeding and management of broiler parent stock so that both the period and severity of feed restriction can be reduced considerably without adverse welfare consequences (SCAHAW, 2000, Recommendations).

4.0 STOCKING DENSITY IN BROILER SHEDS

Stocking density directly affects how much space the birds have to move in but also indirectly affects other factors such as the temperature, humidity, and the quality of the litter and the air. SCAHAW concluded that welfare is poorer when stocking density is high and that major welfare problems can only be avoided if the stocking density is 25 kg / m^2 (12.5 birds per m^2) or less (SCAHAW, 2000, Sect. 7.5.6). This is considerably less than the stocking densities recommended by many European countries. For example, the UK government currently (2005) recommends 34 kg / m^2 and Danish legislation requires a maximum of 43 kg / m^2 during 2003 (to be reduced to 40 kg / m^2 by 2006) (Danish Ministry of Justice, 2001). However, it is estimated by the UK poultry industry that a considerable percentage of poultry farms may use a stocking density as high as 38 kg / m^2 and 16% use a stocking density greater than 38 kg / m^2 (Randall, 2005).

4.1 Crowding and restriction of natural behaviour

SCAHAW believes that high stocking density may restrict chickens' ability to perform natural behaviour. Studies of broilers' behaviour at different stocking densities have shown that as they get more crowded they move less distance per hour, they are more often disturbed by others when they are resting, they do less pecking and scratching at the litter and less walking and preening (SCAHAW, 2000, Sect. 6.9).

The sheds are often very crowded, resulting in restricted movement, wet litter, increased air pollution from ammonia and dust particles and poor temperature and humidity control.

4.2 Litter quality, skin sores and foot sores

High stocking density also leads to dirtier litter. Inactive birds spend most of their time with their shanks or breasts in contact with the litter and if this is wet it can cause sores or 'ammonia burns' on their skin, known as breast blisters, hock burns and foot-pad dermatitis. These various forms of contact dermatitis are very common and have increased the most of all broiler health problems over the last 30 years, according to SCAHAW, affecting over a third of broilers by 1988. The sores initially cause skin discolouration but they can go on to cause ulcers which discharge and become covered with litter and faecal material. The sores can be a gateway for bacteria which may spread through the bloodstream and cause joint inflammation. Another disease that may affect up to 5% of chickens is 'deep dermatitis', a bacterial infection where the skin around the tail end, thighs and cloaca becomes swollen, inflamed and coloured yellow (SCAHAW, 2000, Sect. 6.4).

Studies in France, Denmark and Sweden have shown that foot-pad dermatitis is very common. A survey of 50 chicken flocks on 15 farms in France from May to October 2000 found that only 10% of flocks had under 20% of birds with foot-pad lesions (Martrechar *et al*., 2002). A survey of 23 commercial flocks in Denmark found 41.6% of the chickens had foot-pad dermatitis and a similar survey of 33 flocks in Sweden found that 48.5% or 21.6% (depending on strain) had foot-pad dermatitis (Sanotra, Berg and Lund, 2003). In the UK, the Assured Chicken Production standards allow 15% of chickens to have hock burns (Assured Chicken Production, 2005).

Foot sores and hock burns are related to leg disorders. Birds with leg problems spend more time sitting and, if the litter is wet and dirty with faeces, this results in burns and sores. Foot and hock burns in turn reduce walking activity because they make walking painful (Su, Sørensen and Kestin, 2000).

SCAHAW concluded that contact dermatitis is a 'relatively widespread' problem which can affect many of the birds in some flocks, and that it is associated with crowding, restricted movement, leg weakness and poor litter quality (SCAHAW, 2000, Sect. 6.4 and Conclusions 14).

4.3 Air pollution

High concentrations of ammonia or dust in broiler sheds are damaging to the birds' health and welfare. Ammonia is formed by the decomposition of uric acid in faeces and dust arises from particles of litter, manure, feed, skin and feathers. The amount of air pollution in broiler sheds depends on stocking density and litter quality, as well as efficiency of ventilation. The chickens are permanently exposed to these pollutants and their detrimental effects are well known. High concentrations of ammonia are associated with the development of ascites, with increased respiratory disease and inflammation of the trachea and of the eyes. High concentrations of dust irritate the chickens' respiratory tracts and also lower their resistance to disease and help spread infections. SCAHAW notes that:

> Concentrations of ammonia having detrimental effects on broiler welfare are regularly observed in practice (SCAHAW, 2000, Conclusions 18).

In the UK, a study of air quality in broiler houses published in *British Poultry Science* in 1997 found that average concentrations of ammonia were above guideline exposure limits for animal well-being and that concentrations of inspirable dust 'greatly exceeded' the guideline limit for animals (Wathes *et al*., 1997).

Research at Bristol University Veterinary Department, reported in 2005, has shown that chickens tended to avoid ammoniac atmospheres when they were tested on areas containing concentrations of 4, 11, 20 and 37ppm [parts per million] of ammonia gas. The chickens preferred to be in the lowest available concentration of ammonia. Most of the birds avoided the highest concentration entirely. The scientists concluded that

> Broiler fowl avoid ammonia at concentrations commonly found on poultry units…., suggesting it to be aversive at concentrations above approximately 10ppm (Jones et al, 2005).

4.4 Crowding and temperature control

Broiler chickens kept in sheds are dependent on good ventilation to control the temperature and humidity to a comfortable and safe level. If the ventilation fails the chickens may die from heat stress. By the time they reach slaughter weight, chickens are generating a large amount of heat - up to 15 watts per bird, amounting to 450 kilowatts in a shed containing 30,000 birds (SCAHAW, 2000, Sect. 6.8). The 1997 survey of air quality in four typical UK broiler sheds, mentioned above, found that the ventilation systems were only able to control the temperature in the sheds during the winter, when the external temperature was below 18°C (Wathes *et al*., 1997). Crowded sheds and wet litter increase the risk of overheating and high humidity.

Trials investigating the effect of stocking densities between 28 and 40 kg / m² on the welfare of broiler chickens found that the broilers started to pant regularly from the third or fourth week of life and that the time they spent panting increased consistently. They panted more at higher stocking density - when they were most crowded and there was less possibility for air to circulate. Measurements of the temperature of the air between the birds, of the surface of the litter and of the interior of the litter show that temperatures are significantly higher when the birds are kept at stocking density of 40 kg / m² rather than 19 kg / m². At 40 kg / m² the air temperature between the birds was 29°C, well above the recommended temperature of 19-21°C for 5-week old broilers (SCAHAW, 2000, Sect. 6.8 and 7.3).

A study published in *Animal Welfare* in 2002 found that the broilers were most likely to pant deeply in the last two weeks of their lives, when stocking densities were highest. Deep panting indicates thermal discomfort and poor welfare. The broilers panted less at the lowest stocking density studied and the scientists commented:

> The fact that the proportion of time spent panting deeply in week six was considerably lower at 28 kg / m² than at 34 and 40 kg / m² suggests that thermal comfort (and hence welfare) at this age may be improved at densities of less than 34 kg / m² (McLean *et al*., 2002).

4.5 Stocking density and welfare

SCAHAW concluded from the evidence that: 'Pathologies (breast blisters, chronic dermatitis and leg disorders) are a result of high stocking' and that 'the presence of infectious agents and hock burn has been shown to be worse at 30-40 kg / m² than at 24 kg / m²'. (These densities would correspond to 15-20 birds of 2 kg weight per m² compared to 12 birds per m²). It has also been shown that walking ability is 'severely affected' at very high stocking density and is worse at 32 kg / m² than at 25 kg / m². Walking and other behaviour is reduced and disturbance of resting is increased at high stocking density. In general, all findings are 'indicative of poorer welfare at the higher stocking densities' (SCAHAW, 2000, Sect. 7.5, Conclusions).

The Committee sums up:

> It is clear from the behaviour and leg disorder studies that the stocking density must be 25 kg/m^2 or lower for major welfare problems to be largely avoided and that above 30 kg/m^2 , even with very good environmental control systems, there is a steep rise in the frequency of serious problems (SCAHAW, 2000, Sect. 7.5.6).

Experiments at the Zoology Department of Oxford University, under commercial conditions, suggested that welfare is adversely affected by higher stocking density in a number of ways. At the higher stocking density (around 38-40 kg/m^2) daily mortality was significantly greater during part of the rearing period, especially after the 4th week of life. Leg problems, skin sores and bruising all increased, the birds' lying behaviour was disturbed and walking and ground-pecking behaviour decreased. A sample of dead birds at five weeks old found that the main cause of death was Sudden Death Syndrome (Hall, 2001). A subsequent large-scale study (2.7 million birds) found that fewer birds had completely normal walking ability when the stocking density was high (42 kg/m^2) and the chickens jostled each other more (Dawkins, Donnelly and Jones, 2004). A study at the Scottish Agricultural College has also shown that high stocking density may restrict the broilers' access to food in the last week of their lives (when they are most crowded). The study found that food intake decreased as stocking density increased. The scientists explained:

> The birds' ability to move around freely, and hence to obtain access to feeders, may become increasingly limited because available floor space diminishes as birds grow bigger, and this effect would be greatest at the highest stocking density (McLean *et al*., 2002).

SCAHAW recommends that no sheds should be operated with a stocking density of more than 30 kg/m^2 (15 birds of 2 kg weight per m^2) even with the best climate control and that welfare begins to be compromised at any stocking density above 25 kg/m^2. Sheds with less effective ventilation and management should only be operated at a lower stocking density, specified for that building, until the producer can show that air and litter quality are up to standard (SCAHAW, 2000, Recommendations).

5.0 CATCHING

When they have reached the required weight, broiler chickens are caught and loaded into containers for transport to the slaughterhouse. Prior to catching they will have had feed and water withdrawn to reduce intestinal content at the time of slaughter (typically 1 hour for water and 6-9 hours for feed). If the time for catching, transport and waiting at the slaughterhouse is included, the birds may be deprived of food and water for well over 12 hours before they are killed.

The process of catching often causes them to suffer from stress, fear and injury due to panic among the birds and by rough handling. According to SCAHAW,

> A large part of the bruises found on broiler carcasses [at processing] arise during the catching and loading of birds prior to slaughter (SCAHAW, 2000, Sect. 7.8.3).

5.1 Manual and machine catching

Manual catching is the usual method in Europe. The birds are picked up and packed into crates or drawers in 'modules', which are loaded by forklift truck onto the transporter outside the shed. According to UK government guidelines,

> No catcher should carry by the legs more than three chickens (or two adult breeding birds) in each hand' and 'birds should be caught and carried by both legs (DEFRA 2002).

In practice, according to a UK poultry scientist, these guidelines may be ignored:

> Birds were harvested by a manual catching team of five men... Hand harvesting was employed...with each man catching and carrying 6-8 birds at a time, inverted by one leg (Hall, 2001).

There is abundant evidence that catching often results in injury, especially when a large number of birds are caught with maximum haste by the catching team. A UK meat science expert noted in 1998:

> Hip dislocation occurs as the birds are carried in the broiler sheds and loaded into the transport crates. Normally the birds are held by one leg as a bunch of birds in each hand. If one or more birds start flapping they twist at the hip, the femur detaches, and a subcutaneous haemorrhage is produced which kills the bird... Dead birds that have a dislocated hip often have blood in the mouth, which has been coughed up from the respiratory tract. Sometimes this damage is caused by too much haste on the part of the catchers (Gregory, 1998).

We have seen that a considerable proportion of the 5.9 billion broiler chickens slaughtered annually in the EU may suffer from painful leg or joint disorders. Carrying these heavy birds upside down by one leg each is likely to be painful for them. A 1990 study of broilers that were 'dead on arrival' at the slaughterhouse found that 4.5% of the broilers had dislocated hips (Gregory and Wilkins, 1990). A 1992 study found that in a third of cases the femur had actually been forced into the abdominal cavity. The birds can be pushed down roughly into the crates or drawers, resulting in crushed skulls (Gregory and Austin, 1992) or in wing damage.

In Sweden, on the other hand, broilers are caught and carried by using both hands to hold the wings against the body, a method that reduces the risk of injury (Ekstrand, 1997).

Catching broilers by machine has also been used, with the intention of reducing labour costs and broiler stress and injuries (for instance, by minimising contact with humans during the procedure). Some experts believe that machine catching is preferable from the welfare point of view, so long as the machine speed is kept very slow. In some cases, trials have indicated that machine catching reduces stress (Elkom, 2000), but other studies have found that bruising, fractures and pre-slaughter deaths were not reduced but even increased by machine catching.

'Normally the birds are held by one leg as a bunch of birds in each hand' (Gregory, 1998).

5.2 Thinning

The practice of thinning (also known as thinout) is commonly used in the broiler industry. It involves catching and removing some of the broilers in the shed, as the birds grow bigger, to reduce the stocking density. In France, it is reported to be common to remove some birds at 32 days of age (at weight 1.3 kg) for export, while keeping the rest to 40 days (2 kg) for the national market (Martrechar *et al*., 2001). In the UK, thinning may be done several times during the growing period, removing 10% - 20% of the birds on each occasion. Clearly this practice can impose multiple episodes of stress and injury on the birds in a broiler shed. It also enables the producer to start with a high density of chicks, although according to the UK government guidelines:

> Deliberately placing a high number of chicks and routinely 'thinning' should be avoided as this causes unnecessary stress to the birds and may result in stocking densities that are too high (DEFRA, 2002, para. 64).

A second method of thinning is to rear male and female chicks in the same shed but separated by a fence. The smaller females are caught and slaughtered first, at around 40 days old, and the males are then spread out into the whole of the shed and 'grown on' to 50 - 58 days old, by which time they are very heavy (3.0 kg or more). This practice is also a serious matter for concern because these heavy males are likely to experience suffering from painful leg disorders during their extended growing time.

5.3 Dead on arrival

The results of several investigations into the number of broilers that are 'dead on arrival' at the slaughterhouse show that 'a mortality of between 0.1% and 0.6% is usual' (Ekstrand, 1997). For the whole EU, this could amount to between 18 and 35 million birds dying annually during catching and transport and before slaughter.

Research in the UK, published in 1992, found that 51% of 'dead on arrivals' had died from heart failure:

> Presumably the physiological responses associated with the stress of catching, loading and transporting the birds had been too much for the cardiovascular system to cope with (Gregory and Austin, 1992).

Other important traumatic injuries were haemorrhage from fractured femurs, ruptured livers and crushed heads, and dislocation of the necks during catching or unloading (Gregory and Austin, 1992).

6.0 TRANSPORT

According to the European Food Safety Authority, more chickens are transported than any other species, which means that any welfare problems during chicken transport can affect huge numbers of animals (EFSA, 2004). A modern poultry transporter usually carries approximately 6,000 birds at a time with stocking densities as high as 170 to 200 kg / m^3 (Weeks, 2001; Mitchell and Kettlewell, 1998). Transport time is commonly 3 - 8 hours, but occasionally birds may be confined in a vehicle for up to 12 hours. The major welfare problems associated with transport are stress caused by crowding, heat and vehicle vibration. Broilers have strong aversion to the vibration experienced during transport (Abeyesinghe *et al.*, 2001), which is severe enough to cause discomfort also to humans (Mitchell and Kettlewell, 1998). The stress and muscle tension induced may contribute to increasing the birds' temperature.

6.1 Crowding and thermal stress

In the UK, 40% of broilers that arrive dead at the slaughterhouse may have died as a result of thermal stress and suffocation (Weeks, 2001), often as a result of crowding during transport.

UK veterinary scientists have commented on the modules in which the birds are transported:

> Because of its compound construction, a module full of drawers tends to be poorly ventilated, particularly when the vehicle stops, whether during the journey to the processing plant or on arrival when there is usually a delay before the birds are slaughtered. The modules may be unloaded and stacked in a lairage. The authors have recorded lairage times ranging up to seven hours... Ninety-two per cent of deliveries of birds were held for up to four hours before they were shackled and processed (Warriss *et al.*, 1999).

The birds can become hot and lose water through evaporation in an attempt to keep their body temperature down. They may begin to pant and if water is not given, dehydration will result. Cold stress also commonly occurs and broilers have been known to die of hypothermia during transport (Weeks, 2001).

Millions of EU broiler chickens die during transport to the slaughterhouse

6.2 Need for regulation

It is known that the death rate of chickens increases with the length of the journey (EFSA, 2004). Surveys have indicated that the mortality rate of broilers during transport increases dramatically after four hours (Weeks, 2001). CIWF Trust believes that, in accordance with Animal Welfare Science, Ethics & Law Veterinary Association (AWSELVA) recommendations, loading, travelling and unloading times should be less than two hours and should not exceed four hours. Stocking densities during transport need to be much reduced. Air temperature should be closely monitored and proper ventilation provided.

7.0 THE WELFARE OF BROILER CHICKENS AT SLAUGHTER

On average, around 85 million broiler chickens are slaughtered for meat in the EU each week. Modern broiler slaughter is a high-throughput, high-speed process: up to 200 birds are slaughtered per minute (Kessel *et al*., 2001). Over ten years ago, CIWF Trust's report *The Welfare at Slaughter of Broiler Chickens* (Stevenson, 1993) raised serious welfare concerns about the slaughter process. These concerns continue to be just as relevant today.

7.1 Unloading and shackling

Injury can be caused to the birds during unloading at the slaughterhouse. For example, according to a UK meat scientist,

> [S]ome birds (about 3%) have their claws or toes sheared off as the drawers are pulled out the of the modules. Their toes protrude through the holes in the perforated floor and are sheared at the rim of the module (Gregory, 1998).

After unloading, the conscious birds are hung upside down by their feet from shackles, along a moving line. Rough handling is commonplace during this process. Violent struggling (primarily wing flapping) of shackled birds is common. 90% of broilers are reported to struggle when shackled (Jones *et al*., 1998). The birds can become bruised as they struggle, leading to their carcases being condemned as unsuitable for human consumption or downgraded (Saterlee *et al*., 2000).

Struggling probably indicates pain and discomfort. Many broilers may already have painful leg disorders, so they can be caused serious pain by being hung upside down with their whole weight being supported by their legs. The heavier the birds, the more painful this hanging can become, and so males are particularly likely to struggle. In addition, pain may be caused by the shackle, especially if it is too narrow and squeezes the bird's leg (Saterlee *et al*., 2000). Under EU law chickens may be hung in shackles for up to three minutes before stunning.

Broilers struggle when shackled

7.2 Inadequate stunning

After being shackled, the birds are carried to an electrically-charged water bath through which their head, neck and upper thorax are dragged. Current flows from the electrically live water through the birds to an earthed shackle. This is designed to stun them, i.e. render them unconscious and insensible to pain. The shackle line then takes the broilers to the automatic neck cutters. The intention is that death will be caused by loss of blood in those birds that are not killed by the stunner (Stevenson, 2000).

After neck-cutting the birds enter the scalding tank (water at about 52°C which is designed to ease

plucking). Clearly only dead birds should be placed in the scalding tank.

Scientists agree that two factors are vital to reduce the suffering of chickens at slaughter. Sufficient and suitable electric current must be used to kill the majority of birds in the stunner, by inducing cardiac arrest (SVC 1996). Secondly, both carotid arteries should be severed to ensure a rapid death from loss of blood (Stevenson, 2000).

In the early 1990s most poultry slaughterhouses probably ignored these essential requirements and these practices may still continue. When they are ignored, birds are in danger of regaining consciousness during bleeding out. Some may even be still alive when they are immersed in the scalding tank.

The 'McLibel' court case of 1997 revealed that a number of broilers were still conscious at neck-cutting. This problem is likely to arise either because the stun is ineffective, or because some birds miss the stunning bath completely, probably because they lift their heads above water level as they pass the bath, partly because of 'splashback' from the bath, which may cause shocks to the birds before they are stunned. Also, smaller birds may miss the bath (Gregory, 1998). In the 'McLibel' case the Judge found from the evidence that about 9 birds in every 1,000 missed the stunning bath and had their necks cut while fully conscious (Stevenson, 2000). This could mean that in the EU more than 50 million broiler chickens may have their necks cut while conscious every year.

Millions of EU broilers are not stunned correctly during slaughter © Gaia

8.0 ALTERNATIVES: HIGHER WELFARE BROILER CHICKEN FARMING

This report has been concerned with standard fast-growing broiler chickens kept indoors. Because of concern about broiler welfare, consumers are demanding an increasing supply of free-range broiler chickens, which are given access to fresh air and daylight, environmental stimulation and opportunity for exercise outdoors during their short lives.

Examples of free-range broiler production systems that are already used in Europe are 'Label Rouge', Traditional Free Range and Free Range Total Freedom. These systems use specified slower-growing breeds and have a minimum slaughter age of 81 days (SCAHAW, 2000, Sect. 5.1). In France, premium 'Label' and organic chicken meat together had 33% of market share in 2002, according to the Institut technique de l'aviculture (Caldier, 2004). One major UK supermarket company claims that 30% of its broiler chickens sold are now free-range.

Free-range broiler chickens can enjoy fresh air and exercise

At a minimum, there are 5 complementary indicators of welfare-friendly broiler chicken farming:

1. **Slower growing breeds:** As this report has demonstrated, one of the worst characteristics of broiler factory farming is the use of fast growing breeds. Slower growing breeds are less susceptible to painful leg disorders and heart problems. Such breeds are already being used successfully across Europe, including the Hubbard ISA strains used for traditional free-range systems and for the 'Label Rouge' system, and the Sussex, a traditional breed. These breeds are typically slaughtered at twice the age of fast-growing broilers.

2. **Access to the outdoors/free range:** Access to the outside means that broilers are not continuously subjected to the dirty litter and ammonia-filled atmosphere of the indoor broiler shed. An outdoor range also gives the opportunity for exercise and exploration, at an appropriate age.

3. **Environmental enrichment:** Environmental enrichment is a necessary aspect of good broiler welfare. The provision of straw bales, perches and low barriers has been shown to increase activity and welfare in sheds. The provision of brassicas in baskets is also beneficial. Outdoors, trees, shrubs and areas for dust-bathing have been shown to be necessary to encourage birds to range freely. Broilers naturally avoid open spaces for fear of predation and will not necessarily make use of an open field.

Free-range slower-growing broilers have the physical ability to perch, investigate the environment and enjoy life.

4. **Low stocking densities:** The SCAHAW report stated that stocking densities should be no higher than 25 kg/m^2 to help avoid major welfare problems and says that 'when stocking rates exceed approximately 30 kg/m^2, it appears that welfare problems are likely to arise regardless of indoor climate control capacity' (SCAHAW, 2000, Recommendations).

5. **Shorter transport and waiting times at slaughter:** Transport times should be limited to two hours and should never exceed four hours, as mortality increases dramatically after this. Broilers should be slaughtered without delay after arrival at the slaughterhouse, as long waits in lairages can lead to considerable stress.

9.0 CONCLUSIONS: THE WELFARE NEEDS OF BROILER CHICKENS

- Around 5.9 billion broiler chicks are reared for meat in the EU every year. Most are intensively farmed and kept in windowless, barren and crowded sheds holding up to tens of thousands of birds for the whole of their brief 6 - 7 week lives. At the moment, there are virtually no specific laws in the EU to protect the welfare of broiler chickens on farm.
- The March 2000 report on broiler welfare by SCAHAW confirms the serious criticisms of the broiler industry that Compassion in World Farming Trust has made for many years. The scientific evidence cited in the report shows that:

❍ Selective breeding for ever faster growth rate and feed conversion efficiency has caused most of the welfare problems broilers suffer from today. Broiler chickens have a mortality rate of 1% a week, seven times the mortality rate of laying hens of the same age.

❍ Because they grow too fast, millions and possibly tens of millions of EU broiler chickens a year may suffer from painful lameness due to abnormal skeletal development or bone disease, so that many have difficulty in walking or even standing. SCAHAW says that 'Leg disorders are a major cause of poor welfare in broilers'.

❍ The breeding companies give low priority to reducing lameness in their breeding programs. SCAHAW has concluded that up to now any attempt the breeding companies may have made to reduce leg problems 'has not improved welfare' (SCAHAW, 2000, Conclusion 6).

❍ As a result of selective breeding, broiler chickens' hearts and lungs often cannot keep up with their bodies' fast growth rate. They frequently suffer from heart failure when they are only a few weeks old.

❍ High stocking density in broiler sheds restricts the broiler chickens' behaviour and causes health problems. High stocking density leads to increased leg problems, breast blisters, chronic dermatitis, hock burns and infections. Crowded sheds lead to wet litter, increased air pollution from ammonia and dust particles and ineffective temperature and humidity control, all of which damage the broilers' health and welfare.

❍ The stocking density must be no higher than 25 kg / m^2 (approximately 12.5 birds per square metre) 'for major welfare problems to be largely avoided'. Above 30 kg / m^2 (approximately 15 birds per square metre) there is a 'steep rise in the frequency of serious problems'.

❍ Broilers that are allowed to grow to adulthood to be used for breeding are restricted to between one quarter and one half of the amount of food they want to eat during their growing period and 'appear to be chronically hungry, frustrated and stressed'. SCAHAW says that these breeding birds are 'very hungry', resulting in 'unacceptable welfare problems' and that their welfare 'must be improved' (SCAHAW, 2000, Conclusions and Recommendations).

- Catching the birds to remove them from the shed for slaughter can result in unacceptably high levels of stress, fractures and other traumatic injury (SCAHAW, 2000, Sect. 7.8, Conclusion). There is inadequate legislation in protect broiler welfare during transport. Across the EU, as many as 18 - 35 million broiler chickens may die annually during the process of catching and transport to the slaughterhouse.
- The slaughter process, where broilers are hung upside down in shackles and stunned by dipping in electrified water baths, is also cause for concern. Broilers often experience pain and struggle while hung in shackles and may suffer during the slaughter process. As many as 50 million EU broilers may be slaughtered while not fully unconscious. It is essential that sufficient stunning current is used and that both carotid arteries are cut to reduce the risk of birds regaining consciousness during bleed-out.
- **The scientific evidence shows that the intensive broiler chicken industry inflicts serious health and welfare problems on the birds. The industry's drive to ever faster growth rates leads to painful leg disorders and heart failure in the birds reared for their meat and to severe food restriction and hunger in the breeding birds. In addition, the birds are often housed in sheds that are too crowded and that subject them to suffering from skin sores, uncomfortably high temperatures and unhealthy levels of air pollution.**
- **Compassion in World Farming Trust believes that the EU should now take urgent action to address the serious health and welfare problems of intensively farmed broiler chickens.**

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THE WELFARE OF BROILER CHICKENS IN THE EUROPEAN UNION

2005

ISBN 1 900156 35 0

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Registered Charity number, 1095050, a company limited by guarantee, Registered Number 4590804

Report distributed by:

Compassion in World Farming - Ireland
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