



ZOONOTIC DISEASES, HUMAN HEALTH AND FARM ANIMAL WELFARE

PREVENTION IS BETTER THAN CURE

There is a major threat to humanity and it comes from the very food we eat and the way we farm. Some diseases affecting farm animals, known as zoonotic diseases, can lead to serious illness in humans and may be fatal. As farming methods have intensified and meat production has increased, human health is increasingly being put at risk. These risks can, and must, be managed through improving farm animal welfare and implementing a range of management control measures.

DISEASE AND HUMAN HEALTH

E. coli, *Campylobacter* and *Salmonella* are all bacteria which affect farm animals and may cause food poisoning in people. There are hundreds of thousands of cases each year worldwide, some of which are fatal.

Influenza viruses can affect pigs and chickens. If it is able to transmit to farmers it could spread to the wider population, potentially resulting in a rapid, widespread disease outbreak.

EXPERT STUDY

Compassion in World Farming, with support from The Tubney Charitable Trust and the World Society for the Protection of Animals, commissioned leading experts to compile a series of reports. They examined the public health threat posed by some of the major zoonotic diseases and the effects of farming systems and practices on this threat. This briefing note summarises their findings and provides Compassion in World Farming's policy recommendations.

KEY FINDINGS

- The dramatic rise in meat consumption, particularly chicken and pig meat, increases the risk of exposure to dangerous foodborne pathogens.
- The risk of *E.coli* and *Salmonella* infection is often greater in intensive production systems.
- There is a risk of emerging new strains of influenza viruses as a result of the long distance transport of animals, with potentially devastating impacts for human health.
- The risk from zoonotic diseases can be reduced by using animals breeds, diets and management conditions that minimise stress to the animals.



Photo © CIWF/Martin Osborne

Poor welfare conditions can lead to an increased risk of *Campylobacter* infections in chickens.

E. COLI

Pathogenic *E. coli* is an important foodborne bacterium that can cause serious illness in people and is sometimes fatal.

Sources of infection

Cattle, sheep and pigs can carry it in their gut and meat or animal products can become contaminated at slaughter. Beef, especially minced or ground beef and products made from this, such as hamburgers, are a major source of pathogenic *E. coli* infection.

Effect of farming systems and practices

The grain-based diet used in intensive fattening systems for beef cattle increases the risk of *E. coli* infection. The high stocking densities on these farms increase the likelihood of spread.

Cattle fed on grass and reared extensively are less likely to carry the bacteria and are also likely to have higher welfare. Traditional grass and forage diets have greater amounts of natural plant compounds that inhibit *E. coli* growth.

Intensively farmed cattle are often kept in hot and crowded conditions; this environmental stress can lead to an increased shedding and spreading of the bacteria. Long journeys to slaughter can also cause this. Such conditions are detrimental to an animal's welfare.

Control options and future prospects

Keeping cattle on pasture is likely to be the best way to minimise the risk of *E. coli*. It is also important to keep transportation times to a minimum.

Careful observation of food hygiene and cooking procedures is important to minimise the risk of cross-contamination.

The possibility of a vaccine in the future may reduce the risk of *E. coli*. However, this is unlikely to be able to eliminate it altogether.



Photo © Imagine

Intensively farmed cattle have a higher risk of E. coli compared to pasture-reared herds.

CAMPYLOBACTER

The World Health Organisation has declared *Campylobacter* to be the most important foodborne bacterium for humans. It causes diarrhoea and in some cases may lead to long-term complications and even death.

Sources of infection

Poultry meat and eggs are the main sources of *Campylobacter* infection. At slaughter, meat and meat products can become contaminated by the bacteria from the gut. *Campylobacter* can also be found in the muscle (meat) and liver of chickens.

Effect of farming systems and practices

Poor animal welfare conditions and acute stress can lead to immunosuppression, rendering birds less able to resist infection. The health of chickens is an important factor affecting the levels and spread of *Campylobacter*. The main source of *Campylobacter* is the farm environment. Slower-growing birds in higher welfare conditions may be more robust to the disease, balancing their risk from exposure to the bacteria if free-range, in the farm environment. They may even have a lower risk of *Campylobacter* infection.





Long distance transport increases the risk of zoonotic diseases.

Control options and future prospects

The removal all the birds from the shed at one time and ensuring humane handling during catching and transport, play an important role in minimising acute stress, which can reduce levels of *Campylobacter*.

Biosecurity (preventative measures) are very important but the current high levels of *Campylobacter* suggest it is either no longer working or not being applied properly. The use of slower-growing breeds with lower stocking densities may be more effective at reducing the risk. Other potential control measures, such as vaccination, are being researched.

Careful observation of food hygiene and cooking procedures is important to minimise the risk of cross-contamination.

SALMONELLA

Salmonella is a major cause of foodborne gastro-intestinal disease in people. It causes diarrhoea and can lead to long-term complications and even death.

Sources of infection

Poultry meat and eggs are major sources of *Salmonella* infection. Pig meat is also a significant source.

Control options and future prospects

The risk of *Salmonella* in poultry may be increased in large flocks and in caged housing systems. Some studies have found that the risk can be up to ten times higher in caged flocks compared with free-range flocks.

Acute stress can make animals more susceptible to *Salmonella* infection. For example, the practice of 'forced moulting' (where hens are deprived of food for up to two weeks to induce moulting and trigger a new egg-laying cycle) increases susceptibility to *Salmonella* infection. This is banned in the EU but occurs in countries such as the US and China.

Chicken and pig carcasses are frequently contaminated by gut contents during slaughter. Stress in infected animals, particularly from lengthy journeys to slaughter, may increase shedding of *Salmonella* and contamination at the time of slaughter.

Control options and future prospects

Stringent biosecurity measures and vaccination can substantially reduce the risk of *Salmonella*, especially when coupled with higher welfare farming systems.

It is important to keep transportation times to a minimum and ensure humane handling of animals prior to slaughter.

Careful observation of food hygiene and cooking procedures is important to minimise the risk of cross-contamination.



AVIAN AND SWINE INFLUENZA

Influenza is a virus that infects both animals and people. New virus strains can cause rapid widespread disease – a pandemic – with potentially devastating consequences.

Sources of infection

Influenza viruses in poultry and pigs can sometimes infect people, causing illness, and can be fatal. If it spreads rapidly it could cause a catastrophe.

Effect of farming systems and practices

Intensive poultry and pig farms closely confine large numbers of animals together. They are also often close together in the same area. This may increase the risk of new strains of influenza viruses emerging and spreading. Long distance transport facilitates animals with different influenza strains coming into close contact with each other.

Despite the common perception that industrial poultry production has a lower risk of spreading the disease compared to free-range or backyard farms, research suggests this is not the case.

Lower levels of stress and the presence of sunlight (which kills the virus) in extensive poultry and pig production systems may balance the disadvantages of risk from the virus being spread by the wind or wild birds, particularly ducks, to extensively farmed animals.

Control options and future prospects

Stringent biosecurity can reduce the risk of infection, although it does not eliminate it. Long distance transport should be avoided.

Surveillance and vaccination are important to minimise the risk of spread from avian and swine influenza. Vaccination can sometimes only provide partial immunity, without clinical signs in both people and animals, and therefore can lead to unseen transmission of the virus. It is vital that vaccination programmes are closely monitored.



River Court, Mill Lane, Godalming, Surrey, GU7 1EZ, UK
Email: research@ciwf.org Tel: +44 (0) 1483 521 950
Web: ciwf.org

Registered Charity No. 1095050.

POLICY RECOMMENDATIONS

Governments, Inter-Governmental Organisations (IGOs) and the food production industry must urgently work together to implement the following recommendations:

- **Ensure health** – by developing farming policies for humane sustainable food supplies that ensure the health of animals and people. This includes using animal breeds, diets and management conditions that minimise stress and optimise animal welfare and immunity.
- **Surveillance and vaccination** – helping minimise the spread of disease.
- **Limit transportation time to 8 hours** – ensuring animals are slaughtered humanely on or near to the farm where they were raised.
- **Invest in research and knowledge transfer** – helping support farmers to develop and implement higher welfare livestock systems.
- **Reduce non-therapeutic antibiotic use** – limiting the risk of antibiotic resistance.
- **Encourage consumers to eat less and higher welfare meat** – reducing the risk of exposure to food infected with *Salmonella*, *Campylobacter* or *E. coli*.

This briefing paper was written by Compassion in World Farming, May 2013. It is based on reports by Dr. Janet Daly (Avian influenza and Swine influenza); Professor Tom Humphrey (*Campylobacter*); Dr. Paul Wigley (*E. coli* and *Salmonella*).

This project is part of a series exploring animal welfare and sustainability issues. Funding has been provided by a partnership of three organisations: Compassion in World Farming, The Tubney Charitable Trust and World Society for the Protection of Animals.

A more detailed report is available to download from ciwf.org/ZoonoticDiseases

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