

# Fowl play

## The poultry industry's central role in the bird flu crisis

*Backyard or free-range poultry are not fuelling the current wave of bird flu outbreaks stalking large parts of the world. The deadly H5N1 strain of bird flu is essentially a problem of industrial poultry practices. Its epicentre is the factory farms of China and Southeast Asia and -- while wild birds can carry the disease, at least for short distances -- its main vector is the highly self-regulated transnational poultry industry, which sends the products and waste of its farms around the world through a multitude of channels. Yet small poultry farmers and the poultry biodiversity and local food security that they sustain are suffering badly from the fall-out. To make matters worse, governments and international agencies, following mistaken assumptions about how the disease spreads and amplifies, are pursuing measures to force poultry indoors and further industrialise the poultry sector. In practice, this means the end of the small-scale poultry farming that provides food and livelihoods to hundreds of millions of families across the world. This paper presents a fresh perspective on the bird flu story that challenges current assumptions and puts the focus back where it should be: on the transnational poultry industry.*



*Photo: AFP/POOL- Robert Ghemet*

Men in white rubber suits and gas masks chasing down chickens in rural villages... Chickens sold and slaughtered in live markets... Wild birds flying across the sky... These are the typical images broadcast by the media in its coverage of the bird flu epidemic. Rare are photos of the booming transnational poultry industry. There are no shots of its factory farms hit by the virus, and no images of its overcrowded trucks transporting live chickens or its feed mills converting "poultry byproducts" into chicken feed.

The selection of images sends a clear message: bird flu is a problem of wild birds and backwards poultry practices, not modern industry. In this way, the most fundamental piece of information needed to understand the recent avian influenza outbreaks gets left out of the picture.

Bird flu is really nothing new. It has co-existed rather peacefully with wild birds, small-scale poultry farming and live markets for centuries. But the wave of highly-pathogenic strains of bird flu that have decimated poultry and killed people across the planet over the past ten years is unprecedented -- as is today's transnational poultry industry.

## Chicken concentrate

The transformation of poultry production in Asia in recent decades is staggering. In the Southeast Asian countries where most of the bird flu outbreaks are concentrated -- Thailand, Indonesia, and Viet Nam -- production jumped eightfold in just 30 years, from around 300,000 metric tonnes (mt) of chicken meat in 1971 to 2,440,000 mt in 2001. China's production of chicken tripled during the 1990s to over 9 million mt per year. Practically all of this new poultry production has happened on factory farms concentrated outside of major cities and integrated into transnational production systems.<sup>1</sup> This is the ideal breeding ground for highly-pathogenic bird flu -- like the H5N1 strain threatening to explode into a human flu pandemic.<sup>2</sup>

Nevertheless, the many papers, statements and strategy documents coming out of the United Nations Food and Agriculture Organisation (FAO), World Health Organisation (WHO) and relevant government agencies contain barely a whisper about the implications of industrial poultry in the bird flu crisis. Instead, fingers are pointed at backyard farms, with calls for tighter controls on their operations and greater "restructuring" of the poultry sector. The big poultry corporations are even trying to use the bird flu outbreaks as an "opportunity" to do away with what is left of small-scale poultry production.<sup>3</sup> "We cannot control migratory birds but we can surely work hard to close down as many backyard farms as possible," said Margaret Say,

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1 Hans Wagner, FAO-RAP, "Protecting the environment from the impact of the growing industrialization of livestock production in East Asia", APHCA 26th Session, Subang Jaya, Malaysia, 24-26 August 2002:

[http://www.fao.org/documents/show\\_cdr.asp?url\\_file=/docrep/005/ac801e/ac801e00.htm](http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/005/ac801e/ac801e00.htm)

2 H5N1 is an avian influenza virus subtype, the one that is currently at the centre of fears of a human pandemic.

3 Isabelle Delforge, "The flu that made agribusiness stronger," Focus on the Global South, Bangkok, 4 July 2004: <http://www.focusweb.org/main/html/Article367.html>

Southeast Asian director for the USA Poultry and Egg Export Council.

The reactions from some scientists are no less outrageous. Researchers in the UK are pursuing transgenic bird flu-resistant chickens. "Once we have regulatory approval, we believe it will only take between four and five years to breed enough chickens to replace the entire world population," said Laurence Tiley, Professor of Molecular Virology at Cambridge University.<sup>4</sup>

Backyard farming is not an idle pastime for landowners. It is the crux of food security and farming income for hundreds of millions of rural poor in Asia and elsewhere, providing a third of the protein intake for the average rural household.<sup>5</sup> Nearly all rural households in Asia keep at least a few chickens for meat, eggs and even fertilizer and they are often the only livestock that poor farmers can afford. The birds are thus critical to their diversified farming methods, just as the genetic diversity of poultry on small farms is critical to the long-term survival of poultry farming in general.

The FAO knows this. Before the Asian bird flu crisis, it vaunted the benefits of backyard poultry for the rural poor and biodiversity and ran programmes encouraging it.<sup>6</sup> But today, with the H5N1 strain at the gates of Western Europe, it is more common to hear the FAO speak of the risks of backyard farming. This is a reckless mistake. When it comes to bird flu, diverse small-scale poultry farming is the solution, not the problem.

## Backyard poultry is a solution, not the problem

*The backyard chicken is the big problem and the fight against bird flu must be waged in the backyard of the world's poor.*  
Louise Fresco, Assistant Director-General of FAO<sup>7</sup>

The argument used against backyard farming generally goes like this: in backyard farms, poultry wander around in the open, coming into frequent contact with wild birds carrying the bird flu virus and humans vulnerable to transmission. These farms are thus said to act like a mixing bowl for the constant circulation of the disease. Backyard farms are also frustrating for authorities because their very nature -- small-scale, free-range, scattered and informal -- makes it difficult for them to implement

4 Mark Henderson, "Scientists aim to beat flu with genetically modified chickens," The Times, London, 29 October 2005: <http://www.timesonline.co.uk/article/0,,25149-1847760,00.html>

5 A. Permin and M. Bisgaard, "The Scope and Effect of Family Poultry Research and Development: A general review on some important diseases in free-range chickens," Lead paper for the INFPD E-Conference: [http://www.fao.org/ag/againfo/subjects/en/infpd/documents/econf\\_scope/add\\_paper11.html](http://www.fao.org/ag/againfo/subjects/en/infpd/documents/econf_scope/add_paper11.html)

6 FAO, "In Praise of Family Poultry", Agriculture 21, Rome, March 2002: <http://www.fao.org/ag/magazine/0203sp1.htm> and website for the International Network for Family Poultry Development: <http://www.fao.org/ag/againfo/subjects/en/infpd/home.html>

7 Tran Dinh Thanh Lam, "Bird Flu Strategy Will Hit Poultry Farmers", IPS, Ho Chi Minh City, 15 November 2005: <http://domino.ips.org/ips%5Ceng.nsf/vwWebMainView/9190FA02797E3832C12570BA0022F907/?OpenDocument>

their two major control measures: culling and vaccination.

The argument is widely accepted by governments around the world, and today most farm level laws and policies for the control of bird flu seek to keep poultry separated from wild birds, as seen in Table 1.

**Table 1: Measures to control bird flu targeting backyard poultry in a selection of countries**

Country	Measure
Austria	Ban on outdoor poultry from October to December. Ordinance extended indefinitely around area where H5N1-infected swans were found.
Canada	Ban on outdoor poultry in the Province of Quebec
China	Anhui provincial government decrees all backyard poultry must be kept in cages. Complete ban on backyard birds in Hong Kong
Croatia	Ban on outdoor poultry during migration season
France	Ban on outdoor poultry, with exceptions
Germany	Ban on outdoor poultry.
Italy	Free range birds (15-20% of poultry sector) have to be under wire-screens
Netherlands	Ban on outdoor poultry, with exceptions
Nigeria	Backyard poultry and birds banned within the Federal Capital Territory, Abuja
Norway	Ban on outdoor poultry in eight southern counties
Slovenia	Ban on outdoor poultry
Sweden	Ban on outdoor poultry
Switzerland	Poultry must be kept within roofed enclosures
Thailand	Restrictions on free-ranging ducks. Ban on live poultry markets in Bangkok and slaughterhouses moved to outskirts. Forced collectivisation of small poultry flocks in central provinces.
Ukraine	Sale of live poultry and poultry products produced by private village households is prohibited in the Autonomous Region of Crimea. Ban does not apply to factory produced poultry.
Viet Nam	Ban on poultry farming in towns and cities

By and large, these laws and policies are totally impractical for small farmers. In Southeast Asia, governments, with the support of the FAO, are encouraging farmers to set up mesh screens or bamboo enclosures for their poultry. But the costs, estimated at US\$50-70, are out of reach for Asia's small-holders, who typically make less than US\$1 a day, and, in places like Thailand, where such measures have been enacted, it has immediately forced small farmers to abandon poultry.<sup>8</sup> Even organic

8 A McLeod, N Morgan, A Prakash and J Hinrichs, "Economic and Social Impacts of Avian Influenza" FAO, Rome, November 2005: [http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/avian\\_recomm.html](http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/avian_recomm.html); Chanida Chanyapate and Isabelle Delforge, "The politics of bird flu in Thailand," Focus on the Global South, Bangkok, 20 April 2004: <http://www.focusweb.org/content/view/273/29/>

farmers in Switzerland are giving up their flocks because they cannot afford the added costs of bringing their birds indoors.<sup>9</sup> Furthermore, organic farmers who do not allow their livestock free access to the outdoors, as organic standards around the world require, are at risk of losing their organic certification. The impacts of these measures are already real for farmers even if bird flu is not present in their areas -- and even if there is no evidence that keeping birds indoors does anything to stop the virus.<sup>10</sup>



## Wild birds and poultry should not mix?

*The movement of migratory birds has caused outbreaks to emerge in several countries and regions simultaneously.*  
FAO, November 2005<sup>11</sup>

Despite such statements from the FAO or the WHO, there is still little evidence of migratory birds carrying and transmitting highly pathogenic H5N1. After testing hundreds of thousands of wild birds for the disease, scientists have only rarely identified live birds carrying bird flu in a highly pathogenic form.<sup>12</sup> As the FAO has stated as recently as November 2005, "To date, extensive testing of clinically normal migratory birds in the infected countries has not produced any positive results for H5N1 so far."<sup>13</sup> Nearly all wild birds that have tested positive for the disease were dead and, in most cases, found near to outbreaks in domestic poultry. Even with the current cases of H5N1 in wild birds in Europe, experts agree that these birds probably contracted the virus in the Black Sea region, where H5N1 is well-established in poultry, and died while heading westward to escape the unusually cold conditions in the area.

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- 9 Elisabeth Rosenthal, "Bird flu threat takes away chickens' free range," International Herald Tribune, 9 December 2005.
- 10 A Stegemen et al., "Avian influenza A virus (H7N7) epidemic in the Netherlands in 2003: Course of the epidemic and effectiveness of control measures," *Journal of Infectious Diseases*, 2004, 190:2088-2095; ME Thomas et al, "Risk factors for the introduction of high pathogenicity Avian Influenza virus into poultry farms during the epidemic in the Netherlands in 2003," *Preventative Veterinary Medicine*, 2005, 69:1-11
- 11 A. McLeod, N. Morgan, A. Prakash, and J. Hinrichs, "Economic and Social Impacts of Avian Influenza" FAO, November 2005: [http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/avian\\_recomm.html](http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/avian_recomm.html)
- 12 After testing more than 13,000 wild birds in marshes within bird flu infested provinces in China, scientists identified only six highly pathogenic bird flu viruses in six ducks. The overall conclusion of the study: "Transmission within poultry is the major mechanism for sustaining H5N1 virus endemicity in this region." H Chen et al., "Establishment of multiple sublineages of H5N1 influenza virus in Asia: Implications for pandemic control," *PNAS early edition*, Proceedings of the National Academy of Sciences of the USA, Washington DC, 10 February 2006: <http://www.pnas.org/cgi/doi/10.1073/pnas.0511120103>
- 13 FAO and OIE, in collaboration with WHO, "A Global Strategy for the Progressive Control of Highly Pathogenic Avian Influenza (HPAI)," November 2005: [http://www.fao.org/ag/againfo/resources/documents/empres/AI\\_globalstrategy.pdf](http://www.fao.org/ag/againfo/resources/documents/empres/AI_globalstrategy.pdf)

One popular incident cited in the case against wild birds was a mass outbreak of H5N1 among geese in Qinghai Lake, Northern China. A theory was quickly constructed of how the virus was then carried westwards by migratory birds to Kazakhstan, Russia and even Turkey. But bird conservationists, and notably the organisation BirdLife International, pointed out that Qinghai Lake has many surrounding poultry operations. They also noted that there is a fish farm in the area that the FAO helped construct, and that chicken faeces are commonly used as food and fertiliser in integrated fish farms in China.<sup>14</sup> Furthermore, many trains and roads connect the Qinghai Lake area to areas of bird flu outbreaks, like Lanzhou, the source of infected poultry that caused an earlier outbreak of H5N1 in Tibet, 1,500 miles away.<sup>15</sup> However, none of these alternative scenarios drew much attention from the FAO or other major international authorities.

The main weakness in the migratory bird theory is that the geographical spread of the disease does not match with migratory routes and seasons. "No species migrates from Qinghai, China, west to Eastern Europe," says BirdLife's Dr Richard Thomas. "When plotted, the pattern of outbreaks follows major road and rail routes, not flyways. And the absence of outbreaks in Africa, South and Southeast Asia and Australasia this autumn is hard to explain, if wild birds are the primary carriers."<sup>16</sup> If migratory birds are transmitting the disease, why has bird flu not hit the Philippines or Burma, and why has it been confined to a few commercial operations in Laos, when all three countries are surrounded by bird flu-infected countries? Even if it is possible for migratory birds to transport the disease, as recent cases in Europe suggest, there are much more significant vectors of transmission that should be the focus of attention. There is simply no good reason to batten down the hatches and force poultry indoors.

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14 BirdLife International, "Wild birds 'victims not vectors'", Cambridge, 8 December 2005: [http://www.birdlife.org/news/news/2005/12/flu\\_migration.html](http://www.birdlife.org/news/news/2005/12/flu_migration.html); FAO, "Fish feed formulation and Production; A report prepared for the project Fisheries Development in Qinghai Province," Rome, November 1990: <http://www.fao.org/docrep/field/003/U4173E/U4173E00.htm>.

15 Melville, D and K Shortridge "Reflection and Reaction," The Lancet Infectious Diseases, Vol 4, 2004, pp 261-262.

16 BirdLife International, "Are high risk farming practices spreading avian flu?", press release, Cambridge, 18 January 2006: [http://www.birdlife.org/news/news/2006/01/flu\\_agriculture.html](http://www.birdlife.org/news/news/2006/01/flu_agriculture.html)

**Box 1: Lessons from Newcastle disease**

Oddly, in all the discussion of bird flu there is little reference to parallel experiences with other diseases. Newcastle disease, for example, has already become endemic in most poultry farming areas and vaccination against the disease is now a routine activity for poultry farmers around the world.

Like bird flu, Newcastle comes in mild and highly pathogenic forms. In its endemic form, Newcastle is not a big worry. It typically kills a few baby chicks out of an infected flock and only occasionally results in large die-offs when birds are susceptible.

The virus becomes a major problem when it enters into factory farms. According to researchers Alders and Spradbrow, "In large commercial poultry units, the virus enters flocks through some break in biological security [on food, people, eggs, vehicles], by the introduction of infected birds in multi-age farms, or by aerosol [in the air] from an adjoining property. Once a few birds are infected, spread within the flock will be mainly by aerosol. Large flocks will produce copious quantities of aerosol virus, which can spread with movements of air to other flocks."<sup>17</sup>

It is within this context that the disease can mutate into a highly pathogenic form and wipe out entire flocks. An Australian outbreak in 1998, for instance, killed 10,000 chickens and led to the slaughter of another 100,000. The outbreak took authorities by surprise, as tight quarantine controls had seemingly kept the country free of highly pathogenic strains for 60 years.

"We had assumed it had been brought in from overseas," said Jeff Fairbrother, Executive Director of the Australian Chicken Meat Federation. However, later research by virologists showed that the outbreak occurred when an endemic strain of the virus entered into a factory farm and mutated into a virulent form."<sup>18</sup>

The Australian authorities didn't respond by going after backyard flocks or wild birds potentially carrying the disease and they didn't just accept industry claims about the "biosecurity" of their operations. They made vaccination mandatory for farms with over 500 birds. And what about backyard flocks? Were they also subjected to mandatory vaccination? According to the government's information brochure on the disease outbreak:

"No. A very mild form of Newcastle disease virus is present in all States. Providing that strain does not mutate into something virulent, it poses no threat to birds. The outbreaks we had on the mainland between 1998 and 2002 were caused by a mutation of the endemic mild strain (known as Peats Ridge 1998) into a virulent strain of the virus. All the available evidence indicates that, for such a mutation to occur, it needs a large number of birds in a small area to "generate" the virus mutation process. In simple terms, a small number of birds cannot generate enough virus for the mutation process to occur."<sup>19</sup>

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17 <http://www.fao.org/ag/againfo/subjects/en/infpd/documents/manuals/ND.pdf>

18 "Newcastle Disease Virus, Mutation – Australia", proMED, 7 December 1998.

19 [http://www.dpiwe.tas.gov.au/inter.nsf/Attachments/CART-6FQ8LZ/\\$FILE/backyarders.pdf](http://www.dpiwe.tas.gov.au/inter.nsf/Attachments/CART-6FQ8LZ/$FILE/backyarders.pdf)

## Backyard chickens: vectors or victims?

The bird conservation community has helped us to understand how wild birds are victims not vectors of highly pathogenic avian influenza.<sup>20</sup> The highly pathogenic strains of bird flu develop in poultry, most likely in poultry exposed to milder strains that live naturally in wild bird populations. Within crowded poultry operations, the mild virus evolves rapidly towards more pathogenic and highly transmissible forms, capable of jumping species and spreading back into wild birds, which are defenseless against the new strain. In this sense, H5N1 is a poultry virus killing wild birds, not the other way around.<sup>21</sup>

The same argument holds for small-scale poultry production. Bird flu does not evolve to highly pathogenic forms in backyard poultry operations, where low-density and genetic diversity keep the viral load to low levels. Backyard poultry are the victims of bird flu strains brought in from elsewhere.

When backyard farms are separated from the source of highly pathogenic bird flu, the virus seems to die out or evolve towards a less pathogenic form.

The FAO and the World Organisation for Animal Health (OIE) report that there is evidence that H5N1 is adapting to village chicken in the same way that it has adapted to domestic ducks and that there is "growing evidence that the survival of the virus in smallholder and backyard poultry is dependent on replenishment".<sup>22</sup> It is in crowded and confined industrial poultry operations that bird flu, like other diseases, rapidly evolves and amplifies (see *Box 1*).

It is the links between backyard production and the industrial poultry system -- in both directions -- that are so problematic. Backyard farms can act as reservoirs, as the FAO puts it, harbouring bird flu beyond the reach of authorities until it eventually finds its way into intensive poultry operations where the disease amplifies and potentially evolves to more highly pathogenic forms with the potential for transmission between humans.<sup>23</sup> Backyard farms are also often intimately connected to the industrial system, through markets, inputs (such as day-old chicks and feed) and even veterinary services. The opportunity is always there for highly pathogenic bird flu to pass from the industrial system to small-scale poultry farms or vice-versa.

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20 *Id.*, op cit (note 14).

21 Suarez DL, Senne DA, Banks J, Brown IH, Essen SC, Lee C-W, et al, "Recombination resulting in virulence shift in avian influenza outbreak, Chile", *Emerging Infectious Diseases*, April 2004: <http://www.cdc.gov/ncidod/EID/vol10no4/03-0396.htm>; DL Suarez, "Evolution of avian influenza viruses", *Veterinary Microbiology*, 22 May 2000, 74(1-2):15-27; Toshihiro Ito et al, "Generation of a Highly Pathogenic Avian Influenza A Virus from an A-virulent Field Isolate by Passaging in Chickens," *Journal of Virology*, May 2001, 75(9): 4439-4443.

22 FAO and OIE, in collaboration with WHO, op cit, p 17 and p 22.

23 Interview with Dr Joseph Domenech, Chief Veterinary Officer, FAO, 24 January 2006.

## Why is Laos an exception?

The principal reason why Laos has not suffered widespread bird flu outbreaks like its neighbours is that there is almost no contact between its small-scale poultry farms, which produce nearly all of the domestic poultry supply, and its commercial operations, which are integrated with foreign poultry companies. According to the US Department of Agriculture:

The poultry industry in Laos is predominantly one of smallholders, raising free-range, local chicken breeds nearby their dwellings for meat and eggs, mostly consumed by the household or sold locally for income ... An average village has around 350 chickens, ducks, turkeys and quail being raised in small flocks interspersed among village homes by about 78 families, with women primarily responsible for the flocks. Ducks, turkey, and quail are also raised, with negligible amounts of geese found scattered around the country. The few commercial operations (less than 100 total, with 89 of these located near Vientiane) in the country supply nearby metropolitan areas ... Biosecurity and technology utilization are minimal, with little available veterinary care from either private or government sources.<sup>24</sup>

In other words, Laos is rife with free-ranging chickens mixing with ducks, quail, turkeys and wild birds. These are predominantly native chickens, which account for over 90% of Laos' total poultry production. If free-range farming and migratory birds are responsible for spreading bird flu, one would expect to find the disease raging across the country. This has not happened. In fact, the country's backyard farms have barely been touched.

According to the same USDA report:

A total of 45 outbreaks were confirmed, with 42 of these occurring on commercial enterprises (broiler and layer farms), 38 of these in Vientiane, the capital and primary city of Laos. Another five outbreaks were found in Savannakhet Province (on one layer farm and in smallholder flocks) and another two in Champasak Province (on layer farms). Smallholders who found avian influenza in their flocks were located nearby commercial operations suffering the disease.

Laos effectively stamped out the disease by closing the border to poultry from Thailand and culling chickens at the commercial operations. They were less concerned about the disease spreading out from the affected farms because, unlike in Thailand and Viet Nam, small-scale farmers in Laos are not supplied by big companies with day-old chicks or feed and, outside of the capital, poultry is produced and consumed locally. Poultry production is also more spread out in Laos. It is less dense, less integrated and less homogeneous -- all of which keeps bird flu from spreading and evolving into more pathogenic forms.

The Laos experience suggests that the key to protecting backyard poultry and people from bird flu is to protect them from industrial poultry and poultry products. This is relatively easy to do in a country like Laos where there are few factory farms,

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<sup>24</sup> USDA, "Laos: Poultry and Products - Avian Influenza," GAIN Report, US Department of Agriculture, Washington DC, 16 March 2005.

little use of outside inputs and essentially local food systems. It is much more difficult to extricate the industrial system from the small-scale poultry system in Thailand, Indonesia or China, where both are so intimately connected by geography, markets and production. In these countries, "restructuring" poultry production in ways that support small-scale operations requires a 180-degree turn away from intensive, integrated factory farming and globalised production. This is not, however, what the FAO and governments have in mind when they talk of "restructuring".

## "Restructuring" poultry production

Behind the attack on backyard poultry farming, there is a more sinister agenda. The first page of the FAO and the OIE's *Global Strategy for the Progressive Control of Avian Influenza* reads:

It is also becoming increasingly apparent that many reservoirs of infection can be found in the developing world, in particular amongst the lower-income livestock farming segments; i.e. among the rural poor. This poses serious risks to the livestock sector, which is faced with a rapidly expanding demand for dietary animal protein in many developing countries, driven by growing urbanisation, increasing disposable income, and shifts from starch-based to protein-based foods. There are substantial opportunities for economic growth, particularly in rural areas, to be fuelled by this process, widely termed, 'Livestock Revolution'.



What happened to the FAO's long-standing support for diversified poultry farming? The agency is suddenly preoccupied with protecting the industrialisation of poultry production (ie "Livestock Revolution") from the risks of small-scale poultry farming. It has even begun to talk openly about a restructured poultry industry of the future in Asia that will have:

- more concentrated markets, with fewer, larger producers
- poultry production zones where infrastructure can be concentrated
- compartments for exporting countries, arranged in such a way that a minor outbreak of an exporting compartment will hardly affect export
- live markets moved to the outskirts of cities, with fewer licensed traders, centralised slaughtering and a large number of supermarket outlets in cities
- fewer small producers
- requirements to fence and house all poultry<sup>25</sup>

This would be the death of Asia's small poultry farms. In Viet Nam alone, the FAO admits that the implementation of "production zones" would result in the loss of income of potentially one million small commercial producers.<sup>26</sup> Unfortunately, most governments seem only too eager to embrace such restructuring.

25 A. McLeod, N. Morgan, A. Prakash, and J. Hinrichs, op cit (note 8).

26 Ibid.

Previous FAO statements point in a different direction. "The main beneficiaries of the demand surge [for meat in Asia] are large-scale, urban, capital-intensive producers and processors and urban middle and upper class consumers. The overwhelming majority of the poor do not benefit," said Hans Wagner, Senior Animal Health and Production Officer with the FAO's Asia-Pacific office.<sup>27</sup> Now Asia's poor no longer seem to matter.

### Box 2: Avian influenza and poultry biodiversity

Like the "Green Revolution", the so-called "Livestock Revolution" that has swept across Asia during the past few decades has produced rapid genetic erosion. Local production systems were displaced by integrated systems that rely on a single source of parental stock and small farms were encouraged to give up local breeds for high-yielding breeds that are often not suited to local conditions. As a result, many small farmers now rely on a very limited number of modern breeds that were developed for factory farms.

"Many developing countries still consider breeds from industrialised countries to be more productive, although they have difficulties in coping with the often harsh environment," says Irene Hoffmann, Chief of the Animal Production Service of the FAO. "Developing animal genetic resources on-farm in their production environment is the most effective approach to maintain genetic diversity...[and provide] insurance against future threats such as famine, drought and epidemics."<sup>28</sup>

Local breeds are also easier and cheaper to look after, as they are adapted to the environment and can scavenge for their own food. Plus, they typically fetch a higher price from consumers, who will pay extra for the superior taste and physical attributes.<sup>29</sup>

Farmers and a number of agencies and organisations, including the FAO, are taking steps to reverse the loss of poultry diversity. This year, the FAO is supposed to release its long-awaited *Report on the State of the World's Animal Genetic Resources*, in which the FAO will reiterate its commitment to supporting on-farm genetic diversity and the traditional knowledge and farming practices that maintain and enhance it.<sup>30</sup>

In all the commotion about bird flu, however, the agency has been silent about genetic diversity. There has been no statement about how genetic uniformity contributes to the problem, and not a word about how native chickens might resist the disease, even though there are reports from the World Organisation of Animal Health of local chickens surviving the H5N1 virus.<sup>31</sup> Nor has there apparently been any thought as to how mass culling might destroy local poultry diversity.

Joseph Domenech, the Chief Veterinary Officer of the FAO, says that everything must be done to protect local poultry diversity, especially in Asia, the centre of origin for domestic chicken. However, when asked about the mass culling programmes that the FAO encourages governments to enact during bird flu outbreaks, he admitted that the culling is "indiscriminate" and that the FAO is doing nothing to change the situation.<sup>32</sup>

27 Op cit (note 1).

28 FAO, "Loss of domestic animal breeds alarming," Rome, 31 March 2004:

<http://www.fao.org/newsroom/en/news/2004/39892/>

29 See: [http://www.fao.org/ag/againfo/subjects/en/infpd/documents/econf\\_bang/asia2.html](http://www.fao.org/ag/againfo/subjects/en/infpd/documents/econf_bang/asia2.html)

30 See: <http://dad.fao.org/en/refer/library/reports2/itwg/itwg3.htm>

31 See: [oie.int/eng/info/hebd/aIS\\_55.htm#Sec3](http://oie.int/eng/info/hebd/aIS_55.htm#Sec3)

32 Dr Joseph Domenech, FAO, op cit (note 23).

## The disease factories

*Free-range chickens are healthier because they get to run around. I pay attention to them and know when they get sick. In the factory, nobody pays attention and it's hard to tell when one is sick.*  
Ms Thanh, farmer in Bac Ninh Province, Viet Nam<sup>33</sup>

In September 2004, Cambodian authorities reported yet another bird flu outbreak at one of the country's few commercial broiler operations. This time, the authorities identified the source of the outbreak: chicks supplied to the farm by Charoen Pokphand (CP), the Thai company that is Asia's biggest producer of poultry and poultry feed. The bird flu outbreaks in Cambodia have generally been confined to the country's commercial sector, and all of Cambodia's commercial operations are linked to CP in one way or another, either under contracts or through the purchase of inputs like day-old-chicks and feed that CP imports from Thailand.<sup>34</sup>

CP denied the Cambodian accusations, but in Laos, too, outbreaks of bird flu were confined to poultry farms importing feed and chicks from Thailand. The same appears to be the case in Burma, where there were reports of an outbreak at a factory farm supplied with chicks from CP.<sup>35</sup>

CP is in fact present nearly everywhere bird flu has broken out. In Thailand, the base of the CP empire, and the country where it first introduced its vertically integrated production systems, it contracts production to about 10,000 growers, controlling the entire production chain, from feed to retail poultry sales. It is the biggest supplier of broiler chicks in China, too, with a hatchery in bird flu-infested Lanzhou Province that produces nine million chicks a year.<sup>36</sup> In Indonesia, CP dominates the chicken feed industry and is the number one supplier of chicks for broiler and layer farms. CP also controls half of the industrial poultry sector in Viet Nam, where, in February 2004, the army was mobilised to kill 117,000 birds infected by bird flu at one of CP's farms in Ha Tay Province.<sup>37</sup> CP is even big in Turkey, the latest centre of bird flu outbreaks, where its subsidiary controls around 12% of the country's poultry production.<sup>38</sup>

This is not to suggest that CP is solely responsible for the current bird flu crisis. Although the company is a prime suspect, the problem runs deeper than CP -- it is

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33 Aaron Glantz and Ngoc Nguyen, "Factory fowl no answer to bird flu," Asia Times, 5 November 2005: [http://www.atimes.com/atimes/Southeast\\_Asia/GK05Ae01.html](http://www.atimes.com/atimes/Southeast_Asia/GK05Ae01.html)

34 J Rushton, R Viscarra, E Guerne Bleich and A McLeod, "Impact of avian influenza outbreaks in the poultry sectors of five South East Asian countries (Cambodia, Indonesia, Lao PDR, Thailand, Viet Nam): Outbreak costs, responses and potential long-term control," FAO, TCP/RAS/3010: [http://www.newsweb.org/downloads/avian\\_flu/docs/pdf/impacts.pdf](http://www.newsweb.org/downloads/avian_flu/docs/pdf/impacts.pdf)

35 DVB, "No avian flu in Burma but we are still looking for it, says vet", Democratic Voice of Burma, 1 April 2005: <http://english.dvb.no/news.php?id=4399>

36 From the Chia Tai Group website: <http://www.cpgroup.cn/english/web/subcorpdetails.asp?PageType=01&OrdNo=24%20>

37 J. Rushton, R. Viscarra, E. Guerne Bleich and A. McLeod, op. cit. (note 34); Isabelle Delforge, "The flu that made agribusiness stronger," Focus on the Global South, Bangkok, 4 July 2004: <http://www.focusweb.org/main/html/Article367.html>

38 "News shorts", Meat Processing, Mount Morris, 2 December 2003: <http://www.meatnews.com/index.cfm?fuseaction=PArticle&artNum=6569>

systemic. The international poultry trade is essentially out of control. Look at the numbers of live chickens traded in some of the Eastern European countries recently hit by bird flu outbreaks in Table 2. In the Ukraine alone, nearly 12 million live chickens were imported in 2004. The real numbers are almost certainly higher, given the well-known underground poultry trade moving through the region.<sup>39</sup> The Hastavuk Company in Turkey operates Europe's second largest hatchery, with the capacity to produce over 100 million hatching eggs per year, a substantial portion of which is exported to Eastern Europe and the Middle East. Hatching eggs are well-known to spread bird flu.<sup>40</sup> Yet, despite the clear risks, there is hardly any regulation or monitoring of the poultry and egg trade in the region.

**Table 2: Live chicken exports and imports (2004)**

Country	Exports	Imports
Romania	260,000	16,178,000
Russia	1,351,000	11,724,000
Turkey	4,155,000	1,821,000
Ukraine	1,802,000	11,827,000

Source: *FAO Stat*, FAO, Rome, 2005.

The internal poultry trade shows the same pattern. The media were quick to jump on migratory birds when reports came out of outbreaks of bird flu in a remote rural village in Eastern Turkey. But later, once villagers began to give their side of the story, it emerged that a large factory farm nearby regularly sends trucks to the town to sell off old birds at discount prices. One such truck was sent in a couple of weeks before the outbreak was discovered.<sup>41</sup> The FAO acknowledges that the poultry trade spread H5N1 within Turkey and even singled out the common practice of commercial poultry farms sending out huge truckloads of low-value birds to poor farmers.<sup>42</sup>

The global trade in poultry feed, another factor in this whole mess, is dominated by the same companies. One of the standard ingredients in industrial chicken feed, and most industrial animal feed, is "poultry litter". This is a euphemism for whatever is found on the floor of the factory farms: fecal matter, feathers, bedding, etc.<sup>43</sup> Chicken meat, under the label "animal by-product meal", also goes into industrial chicken feed.<sup>44</sup> The WHO says that bird flu can survive in bird faeces for up to 35 days and,

39 USDA, "Poultry Export Guide: Poland, Ukraine, Estonia, Latvia," Washington DC, September 1998: [http://www.ams.usda.gov/tmd/mta\\_reports/poulexgu.pdf](http://www.ams.usda.gov/tmd/mta_reports/poulexgu.pdf)

40 FAO, "Avian Influenza: Disease Card," Rome: <http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/avian.html>

41 Elisabeth Rosenthal, "Why do some Turks have bird flu virus but aren't sick?" International Herald Tribune, 11 January 2006.

42 J Lubroth, Senior Officer, FAO, "Audio interview: Control campaign in Turkey [Press conference]", Rome, January 2006: [http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/special\\_avian.html](http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/special_avian.html) and Elisabeth Rosenthal, "UN Aide urges flu transit checks" International Herald Tribune, Paris, January 17, 2006.

43 According to the US Food and Drug Administration, "Poultry litter consists of bedding, spilled feed, feathers, and fecal matter. It is a common ingredient in animal feed." [http://www.fda.gov/ora/about/enf\\_story/ch5/cvm1.htm](http://www.fda.gov/ora/about/enf_story/ch5/cvm1.htm)

44 In Indonesia, chicken feed contains on average 3% "animal by-product meal":

in a recent update to its bird flu fact sheet, it mentions feed as a possible medium for the spread of bird flu between farms.<sup>45</sup> Russian authorities pointed to feed as one of the main suspected sources of an H5N1 outbreak at a large-scale factory farm in Kurgan province, where 460,000 birds were killed.<sup>46</sup> Yet, globally, nothing is being done to tighten regulations or monitoring of the feed industry. Instead it often seems that the industry, not governments, is calling the shots.

### **"Trust us": industry and government cover-ups**

In Indonesia, late in 2005, with bird flu raging across the country and killing people, the Minister of Agriculture told the media that the 11 biggest poultry farms were using certain laws to block inspections of their operations. CP, of course, denied the accusations. "As long as they followed our procedures, we always welcome them," said Sudirto Lim, spokesman of CP Indonesia.<sup>47</sup> Small farmers certainly do not have the luxury of dictating inspection procedures -- the authorities just burst into their homes and seize their chickens, whether they are welcomed or not.

In Thailand, the industry and government knew about bird flu outbreaks months before public pressure finally forced the government to admit to outbreaks of bird flu in January 2005. Industry used that time to clean out its inventory and look after its profits. Poultry workers at the Centaco poultry plant near Bangkok told researchers Chanida Chanyapate and Isabelle Delforge that in the months leading up to the government's official acknowledgement of the outbreak, they were asked to work much more overtime than usual. "Before November, we were processing about 90,000 chickens a day. But from November to January 23, we had to kill about 130,000 chickens every day." They saw many diseased chickens arriving in the factory and were ordered to process them, even if they had already died from the illness. "We didn't know what the disease was, but we understood that the management was rushing to process the chicken before getting any veterinary inspection."<sup>48</sup>

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[http://www.fao.org/documents/show\\_cdr.asp?url\\_file=/DOCREP/004/AB986E/ab986e08.htm](http://www.fao.org/documents/show_cdr.asp?url_file=/DOCREP/004/AB986E/ab986e08.htm)  
45 WHO, Fact sheet on avian influenza, Geneva, updated January 2006 :  
[http://www.who.int/csr/disease/avian\\_influenza/avianinfluenza\\_factsheetJan2006/en/index.html](http://www.who.int/csr/disease/avian_influenza/avianinfluenza_factsheetJan2006/en/index.html)  
46 "Kurgan province will suffer more from bird influenza than other regions," Regnum, Moscow, 10 October 2005: <http://www.regnum.ru/news/medicine/525941.html>  
47 CPAS, "Indonesia to revise laws barring access to poultry farms," AgroIndonesia, 25 October 2005: <http://www.agroindonesia.com/agnews/eng/2005/October/25%20October%2001.html>  
48 Chanida Chanyapate and Isabelle Delforge, op cit (note 8).

**Box 4: Of pandemics and patents**

The H5N1 virus was first noticed and identified when it took its first human victims in Hong Kong in 1997. A few years later, in 2003, similar deaths were reported in Viet Nam and then in Thailand. The following year it killed people further afield in Indonesia, China and Cambodia. Until mid-2005, bird flu was generally seen as an 'Asian' problem. Then the World Health Organisation took the huge political decision to tell the world that we are on the verge of a global human pandemic that could kill 150 million people. As intended, the effect was dramatic.

Bird flu is essentially a poultry disease. The WHO tallies less than 200 confirmed human cases of H5N1 and under 100 deaths, most of them through contact with infected chickens. The big worry is that H5N1 will mutate into a form that is readily transmitted from human to human. After all, influenza viruses replicate like crazy, but very sloppily, generating constant mutations. Once this happens, the consequences could be immediate and severe, as it is assumed that most people do not have antibodies against H5N1.

The WHO pronouncement triggered, for the first time, concern about avian flu in the West. In no time at all, the spotlight fell on the Swiss drug giant, Roche. Roche has the exclusive license to produce Tamiflu (the trade name for oseltamivir), an anti-viral believed to have some effect in reducing the spread of avian flu in humans. It was developed and patented by Gilead Sciences, a US drug firm which gave Roche the exclusive right to manufacture the pill. With huge corporate media attention, Tamiflu -- and Roche -- suddenly became the answer to the potential pandemic.

It is, however, not at all certain that Tamiflu would be a help, should a human pandemic break out. Tamiflu's effectiveness is highly contested, and it carries important side-effects as well. It does reduce the symptoms of influenza, but taken in low dosage it could actually exacerbate the spread of the disease through a rapid emergence of resistant strains and/or because sick people feel better and let their guard down against infecting others. The low dosage risk is very real. One reason is that there is a worldwide shortage of Tamiflu. Roche's version is produced with shikimic acid extracted from Chinese star anise pods, the best of which comes from only four provinces of southwest China. (A full 90% of their production is bought by Roche.) And Roche has been reticent to sublicense the rights to produce it. The other reason is that Roche recommends prophylactic use of Tamiflu for human influenza, though this is not effective. Numerous people taking Tamiflu in Viet Nam have died of H5N1 because the drug only helps if you take it within 18 hours of infection.

***Making money from misery***

Tamiflu has, however, been a big money-spinner for its owners. The patent is owned by Gilead while Roche has the sole licence. Roche's sales of Tamiflu -- a drug that hardly sold prior to the WHO announcement -- went up 400% in 2005 while Gilead's royalty earnings from the patent grew by 166%. In the US, the drug industry is intimately connected with the highest levels of government. In November 2005, Bush announced a set of domestic measures to fight the possible pandemic which included an envelope of US\$1.4 billion to go shopping for Tamiflu. This was a gift, not only for Roche and Gilead, but also for people like US Secretary of Defense Donald Rumsfeld, board member and former chairman of Gilead. He currently owns somewhere between US\$5 million and \$25 million of Gilead equity, making him possibly the largest shareholder. Other people who stand to gain from this policy are Gilead board members George Schultz, former US Secretary of State and Bush campaign advisor, Etienne Davignon, Vice-Chairman of Suez-Tractebel and Honorary Chairman of Bilderberg, and John W Madigan who among other things is on the Defense Business Board, a corporate advisory council to the US Department of Defense.

Beyond the inevitable conspiracy theories, the bigger controversy came from Roche's handling of the licencing issue. The pressure to allow poor countries to produce or buy the generic form of oseltamivir has been great: some 150 generic manufacturers and governments have requested a sublicense. Roche, caught between a rock (poor public relations ratings) and a hard place (its own shareholders) held back, despite pressure from Gilead, from governments, and even from Kofi Annan, who came out of the woodwork to announce that he did not want a repeat of the AIDS drug crisis. Finally Roche decided to selectively soften up and grant a few limited sublicences, but the damage had been done. Once again, the conflict between exclusive commercial interests, which patents serve, and the higher social interest in public health, which governments are supposed to serve, was laid bare.

Meanwhile, in the Ukraine, the government, on the advice of its big poultry companies, refused to implement mandatory vaccination programmes or quarantines in the Crimea region, where bird flu outbreaks have raged since September 2005, because of the potential loss of exports to the European Union. The government initially ignored reports from villagers, who began complaining of mysterious poultry deaths in September 2005, and then, when it eventually did act, reassured the public that the bird flu outbreaks were only in backyard farms and that chicken from factory farms was completely safe. Immediately thereafter, news emerged of three outbreaks on factory farms in the Crimea.<sup>49</sup>

The poultry industry trumpets the "biosecurity" of its operations. Its refrain is that it is easy to seal off its integrated systems from bird flu. But time and time again, bird flu finds its way in and causes massive outbreaks at factory farms: Australia (1976, 1985, 1992, 1994, 1997) USA (1983, 2002, 2004), Great Britain (1991), Mexico (1993-1995), Hong Kong (1997), Italy (1999), Chile (2002), Netherlands (2003) and Canada (2004), just to cite a few examples outside of the recent bird flu crisis.

In 2004, a number of outbreaks occurred in several ultra-modern chicken farms in Japan. One of these farms, among the largest in the country, did not tell the authorities when its chickens began dying in large numbers. Instead it sent a shipment of 15,000 birds to a slaughterhouse ahead of schedule. The government only found out about the outbreak through an anonymous tip.<sup>50</sup> The same thing happened in the Ukraine where one of the factory farms in the Crimea hit by the bird flu waited a week to tell authorities, taking no security measures in the interim.<sup>51</sup> And most recently in India, local authorities say that H5N1 first broke out and spread from a factory farm owned by the country's largest poultry company. The district government slapped a notice on Venkateshwara Hatcheries under the Bombay Police Act for "causing public nuisance and threat to health," but the company continues to claim its premises are biosecure and deny its involvement in spreading the disease.<sup>52</sup>

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49 5 Kanal, "Criminal charges laid in flu outbreak in Crimean factories," 5TV, Kiev, 10 January 2006  
<http://www.5tv.com.ua/eng/newsline/184/0/19445/>

50 "Lapses in halting avian flu," Editorial, The Japan Times, Tokyo, 3 March 2004

51 5 Kanal, "Crimea: Prosecutors lay charge in bird flu mishandling," 5TV, Kiev, 12 January 2005:  
<http://www.5tv.com.ua/eng/newsline/184/0/19487/>

52 "Hatcheries put on notice," The Statesman, Kolkata, 21 February 2006:

<http://www.thestatesman.net/page.news.php?clid=2&theme=&usrsess=1&id=107510>

**Box 3: When bird flu strikes Africa...**

When an outbreak of H5N1 was confirmed in Nigeria in February 2006, the FAO and much of the international scientific community once again pointed to migratory birds, even though the infected factory farm was not close to migratory wetlands and there was no evidence of infection or die-offs among wild birds in the area.<sup>53</sup> "If it's not wild birds, it will be difficult to understand," said Joseph Domenech of the FAO.<sup>54</sup>

The Nigerian authorities, however, pointed immediately to the poultry sector, one of the largest and most industrial in Sub-Saharan Africa. And why not? There is a precedent. Back in 2003, with outbreaks of bird flu raging in the Netherlands, a Nigerian poultry farm imported nearly 30,000 hatching eggs from one of the infected farms in the Netherlands. Fortunately, Dutch authorities notified their Nigerian counterparts of the shipment in time for them to take measures to "curtail the disease from spreading to other farms." The Nigerian factory farm, meanwhile, first admitted to the import, then denied it and then claimed to have destroyed all the eggs.<sup>55</sup>

This time around, bird flu broke out again on a single factory farm with over 40,000 birds. The farm is owned by the country's Minister of Sports and, as one Nigerian poultry expert told GRAIN, "such people often do things 'their way' without paying any or enough attention to the rules." As it turns out, the farm in question was not using registered hatching eggs, meaning that the hatching eggs, which are not subject to the import ban placed on poultry, were likely imported, and may well have come from a bird flu infected country like Turkey, a leading exporter of hatching eggs.<sup>56</sup>

The disease then spread to other factory farms, with one local poultry farmers' association claiming that over 150,000 birds had died on 30 poultry farms owned by their members in the area.<sup>57</sup> An affected poultry farmer told the BBC that the factory farms are rapidly dumping their sick chickens on the market to beat future quarantines and make a quick profit. "Here, the farmers have been killing their sick birds. The dead birds are being sent to market to be sold as meat. It's a health hazard," said poultry farmer Auwalu Haruna.<sup>58</sup>

53 David Brown, "Poultry, Not Wild Birds, Most Often Carries Deadly Avian Flu to Africa," Washington Post, 16 February 2006.

54 Jia-Rui Chong, "African Bird Flu Case Confirmed", Los Angeles Times, 9 February 2006: [http://www.latimes.com/news/printedition/asection/la-sci-birdflu9feb09\\_0,7038039.story?coll=la-news-a\\_section](http://www.latimes.com/news/printedition/asection/la-sci-birdflu9feb09_0,7038039.story?coll=la-news-a_section)

55 Olukayode Oyeleye, "FG Confirms Importation Of Infected Eggs As Institute Backs Poultry Farmers," The Guardian, Lagos, 8 June 2003.

56 According to Chief Olatunde Badmus, National Chairman of the Poultry Association of Nigeria, "Records have shown that the birds from the Kano and Kaduna cases were not from registered hatcheries," The Punch, Lagos, 15 February 2006: <http://www.punchng.com/politics/article02>

57 Charles Ozoemena and Tina Anthony, "Bird flu spreading South," The Vanguard, Lagos, 14 February 2006.

58 BBC, "Nigerian bird farmer warns of health risks", London, 8 February 2006: <http://news.bbc.co.uk/1/low/world/africa/4693850.stm>

## Getting serious about bird flu

Even before the advent of the current bird flu crisis, factory poultry farming was already an environmental and socioeconomic disaster. In recent years, the industry has been able to grow in developing countries only by externalising costs and using monopoly power to exploit workers and contract producers -- the local people have to bear the costs and the benefits go elsewhere, as much of the product is exported to wealthier countries.

Now, with the H5N1 outbreaks, people are dying because of this industry, and the problem will never go away as long as factory farming continues to expand and operate without accountability. Bird flu is yet another of the scandals that have played out time and again with other sectors of the transnational food industry, from mad cow disease to Star Link maize. It is simply shameful that the poultry industry is trying to spin it into another growth opportunity on the back of small farmers.

Meanwhile, FAO, which knows perfectly well how important poultry is to the rural poor, is complicit in this industry strategy. It has done little to shield small-scale poultry from baseless accusations. Worse, it has seized on weak evidence to promote the idea that backyard farms are part of the problem. Most governments, South and North, often closely connected to the powerful poultry industry and taken in by neoliberal orthodoxy, have been happy to go along.

This is no small matter. H5N1 is a reality, and so are the concerns about a human pandemic. However, if we accept the wild-birds-and-backyard-flocks theory and ignore the role of the transnational poultry industry, we are throwing open the door to such a pandemic. The strategy to contain H5N1 by destroying the genetically diverse backyard flocks and developing even more intensive poultry operations will, perversely, increase the possibility -- likelihood, some feel -- of a human-transmissible version of lethal bird flu emerging from the large-scale factory farms, the heart of today's globalised chicken production and trade.

The FAO has recently shown some willingness to go beyond the migratory bird theory and look at the role of the poultry industry. "It is very easy to blame wild birds and the migration of birds because nobody is responsible. It is possible that wild birds may introduce the virus, but it is through human activities of commerce and trade that the disease spreads," said Juan Lubroth in January 2006.<sup>59</sup> But not nearly enough is being done to address or even identify those "human activities" at the root of the bird flu crisis.

If bird flu is as serious as the WHO says it is, if millions of people could potentially die from an H5N1 pandemic, then how is it that this industry continues to operate with so little oversight and so much impunity and support from governments? What people really need is adequate and enforced protection from the transnational poultry industry. This will take strong and concerted pressure from civil society, to cut through the hype and hysteria, stand up for small-scale farmers and backyard poultry and start building food systems that put people before profits.

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<sup>59</sup> J Lubroth, Senior Officer, FAO, op cit (note 42).

GRAIN, 2006, *Fowl play: The poultry industry's central role in the bird flu crisis*, GRAIN Briefing, February 2006, <http://www.grain.org/briefings/?id=194>



Photo: Reuters

**About GRAIN**

GRAIN is an international non-governmental organisation which promotes the sustainable management and use of agricultural biodiversity based on people's control over genetic resources and local knowledge. For more information visit: [www.grain.org](http://www.grain.org)