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THE ECONOMICS OF FACTORY FARMING

A PAPER BY COMPASSION IN WORLD FARMING

If we want to introduce the sustainable, safe and humane agriculture which the public increasingly wants, we have to let go of the cheap food policy, which is what has fuelled industrial agriculture. The cost of changing to better systems is often exaggerated. As will be shown below, changing to higher welfare systems often adds relatively little to on-farm production costs. Indeed in some cases, as will also be shown below, improving welfare sometimes reduces costs and increases productivity. However, in cases where extra costs, albeit small ones, are involved, it is essential that farmers are not left to bear the burden of these increased costs alone, but instead we as consumers must be prepared to pay the little extra needed for our food.

Compassion in World Farming (CIWF) believes that as responsible consumers we should be willing to pay the little extra needed so that animals can be kept in kinder and healthier systems. We are, in general, a reasonably wealthy society. We can afford the lottery, holidays abroad, a range of luxuries. Are we really saying that we cannot afford decent standards of farm animal welfare?

Indeed the drive to produce cheap food has arisen, not because most of us are so poor that we could not feed ourselves without factory farmed food, but because we wish to save money on essentials so that we can afford even more luxuries.

That said, there are some people for whom every penny counts. The answer to their situation is not to continue with factory farming, but to adopt social policies designed to ensure that everyone can afford food which is safe, nutritious and humane. Indeed, it is worth pointing out that people may well have a healthier diet if they were to replace some of their meat consumption with fruit and vegetables.

Today we spend only 17% - or even less – of our income on food, whereas around 50 years ago it was over 30%. So, the suggestion that we spend a little more on our food comes at a time when food is costing us less, as a proportion of overall expenditure, than ever before. The dramatic fall in the proportion of our income spent on food has in part been achieved by the use of husbandry systems with very poor welfare. If we were willing to slightly increase the proportion of our income spent on food, we could easily afford to introduce humane production methods.

Production cost differences as between factory farming and higher welfare systems

The widely-held assumption that factory farming is inherently much cheaper than more humane systems proves in many cases to be false. For some products the on-farm production costs – as opposed to the price charged by retailers – are only slightly higher for improved welfare systems as compared with factory farming. In other cases a more humane system can actually result in lower production costs.

Economics of the ban on sow stalls

In their report published in January 2001, the European Commission pointed out that, as regards investment, some forms of group housing are cheaper than sow stalls (*European Commission, 2001*). The Commission added that overall pig production costs (i.e. including both building and running costs) are also lower in some group housing systems than with sow stalls.

Figures from other studies also show that group housing can involve lower capital costs than sow stalls. In their 1997 report the SVC calculated that capital costs are lower for group housing than for sow stalls if the electronic sow feeder (ESF) system is used (*SVC, 1997*).

A study at the Dutch Research Institute for Pig Husbandry (Rosmalen) found that housing investment is 2% less for the ESF system than for sow stalls (*Rosmalen, 1997*). The French Institut Technique du Porc has reported that group housing in strawed buildings involves lower investment costs as compared with both sow stalls and group housing with slatted floors (*ITP, 1998*). Similarly, the Centre for European Agricultural Studies has calculated that group housing reduces building investment costs by £2.74 per sow place (*CEAS, 2000*).

Turning to the overall impact of capital and running costs, figures from France (Institut Technique du Porc), the Netherlands (Rosmalen Institute) and the UK (MLC and CEAS) show that even in the better group housing systems – ones giving reasonable space and ample straw – a kg. of pigmeat costs less than 2p. more to

produce than in sow stalls (*ITP, 1998; Rosmalen, 1997; MLC, 1999; CEAS, 2000*).

In France, the ITP's calculations show that the overall cost of changing from sow stalls to group housing is less than 2 pence per kg. of pig carcass, even if the sows are given straw. The extra cost is 0.029 ECU (1.8 pence) per kg. of pig carcass if the sows are kept in strawed buildings and 0.006 Ecu (0.4 pence) per kg. of pig carcass if they are kept in slatted buildings (*ITP, 1998*).

In a comparative study of pig farming costs in various European countries, the Meat & Livestock Commission (MLC) estimated the cost of a change from sow stalls to group housing in Denmark to add 1.5 pence to the cost of producing 1kg. of pigmeat (*MLC, 1999*). The MLC found that in the UK, moving from sow stalls to group housing added 1.6 pence to the cost of producing 1 kg. of pigmeat (*MLC, 1999*).

As EU consumers each eat on average 42 kg. of pigmeat a year, the recently agreed EU ban on sow stalls will add less than £1 a year to each person's food bill. As UK consumers each eat on average only 21.3 kg. of pigmeat a year, the move from sow stalls to group housing should be costing consumers less than 50p. each per annum. As indicated earlier, CIWF wishes to emphasise that if we want improved welfare standards, they must be paid for by consumers not by eroding farmers' profit margins.

Battery cage ban

Data published by the National Farmers Union in 2001 shows that the production costs of a dozen battery eggs amount to 44.8p. The production costs for a dozen barn eggs come to 53.3p. and for a dozen free-range eggs to 62.2p (*NFU, 2001*). The NFU adds that free-range egg production is subject to additional costs ranging from 0.5 – 1.5p. per dozen; we have averaged this additional figure out at 1p. per dozen, which means that the cost of a dozen free-range eggs is 63.2p.

If these per dozen figures are transcribed to production costs per egg, they show that the production costs of one battery egg amount to 3.73p., while the production costs of one barn and one free-range egg are 4.44p. and 5.27p. respectively.

This means that a free-range egg costs just 1.54p. more to produce than a battery egg, whereas a barn egg costs just 0.71p. more to produce than a battery egg.

UK consumers eat 163 eggs per person per year; this figure includes the eggs used in processed foods, etc. (*Poultry World, 2001*). As a free-range egg costs just 1.54p. more to produce than a battery egg, we could change from battery to free-range eggs for just £2.51 per person per year, provided that retailers charged no more extra for free-range eggs than is justified to cover their extra production costs.

As a barn egg costs only 0.71p. more to produce than a battery egg, changing from battery to barn eggs would add just £1.16 to each person's annual expenditure on eggs, subject to the proviso in the previous paragraph about retailers' prices.

Improved welfare can lead to reduced production costs

In better welfare systems, animals will tend to be healthier. This can lead to savings in terms of reduced expenditure on veterinary medicines, and lower mortality rates. Healthier animals also can produce economic benefits in terms of lower feed conversion ratios and higher growth rates.

Ruiterkamp (1987) found that high levels of penmate-directed behaviour in barren rearing environments have a negative effect on the productivity of pigs due to disturbances in feeding patterns. *Morgan et al (1998)* also found lower growth rates among pigs in barren rather than enriched environments and suggested this was due to increased energy requirements for heat maintenance in the absence of sub-strates.

Beattie et al (2000) compared the rearing of fattening pigs in either barren or enriched environments. The latter incorporated extra space and an area which contained peat and straw in a rack. During the finishing period (15 – 21 weeks) mean daily food intakes were higher and food conversion ratios were better for pigs in enriched environments compared with those in barren environments. Growth rates were also higher for the pigs in enriched environments during this period, and this resulted in heavier carcass weights. The authors report that environmental enrichment also had a small but significant effect on meat quality, with pork from pigs reared in barren environments being less tender and having greater cooking losses than pork from pigs reared in enriched environments.

A range of studies have produced substantial evidence that increasing the available floor area will benefit the growth rate of finishing pigs (*Edwards et al, 1988; Brumm et al, 1996; Meunier-Salaun et al, 1987; Gonyou & Stricklin, 1997; Pearce et al, 1992*).

A major Swedish study by *Jonasson & Andersson, (1997)* also concluded that giving more space to fattening pigs led to higher growth rates, better feed efficiency and improved health which in turn led to fewer veterinary treatments, lower death rates and less rejections at slaughter. The Swedish study also found that the economic benefits of providing straw for slaughter pigs outweigh the costs of the straw and the associated additional labour costs. The study also shows that group housing sows rather than keeping them in close confinement leads to economic gains as a result of having a healthier animal.

The Federation of Swedish Farmers reports that the advantages of group housing sows (rather than using stalls) are improved health and fertility in the sows,

including improved longevity, fewer leg problems, easier farrowing, few piglets born dead and less mastitis and agalactia (*FSF, 2000*). These health improvements will presumably be reflected in lower veterinary costs and improved economic performance.

A Danish study has analysed housing systems for slaughter pigs and shows that the straw-flow system has better profitability than traditional systems with fully or partially slatted flooring (*Norgaard & Olsen, 1995*). The study reports that the straw-flow system requires 20% less capital and that these lower capital costs outweigh the higher labour input and the straw consumption of the straw-flow system.

The Danish study also looked at a variety of systems for housing sows, including close confinement systems with fully or partially slatted floors, indoor group housing systems and outdoor systems. They found that the indoor group housing systems had a lower capital requirement than the close confinement systems, and that the outdoor systems had a significantly lower capital requirement than any of the indoor systems. The Danish study concludes that, while the outdoor systems have a lower gross margin and a higher labour input, these are fully compensated for by lower capital costs. The most significant difference between the systems is the rate of return on the total capital invested, this being around 24% for the outdoor systems and about 5-8% less for the indoor systems.

Maw et al (2001) studied 23 pig farms in Scotland. Data were collected on management practices, genotype, feed and housing characteristics. Sixteen attributes of bacon samples were assessed describing appearance, texture, taste and aroma. The main differences were found to be due to housing conditions, floor type and breed type, with pigs reared in straw courts giving rise to bacon of superior eating quality compared to those kept on concrete or slatted floors.

Non-welfare factors have greater impact on costs and prices than welfare

The Meat & Livestock Commission (MLC) reported in 1999 that the cost of feed varied between the major pig producing countries of Europe by 14 pence per kg. of pig produced and the environmental costs varied by 8 pence per kg. (*MLC, 1999*). These factors have much more impact on pig production costs than which sow housing system is used; as seen earlier, even the better group housing systems add less than 2 pence to the cost of producing a kg. of pigmeat as compared with sow stalls.

Moreover, in a letter to MPs, Grampian Country Foods stated that a range of factors had added a total of 44p. per kg. to the production cost of UK pigmeat by the end of 1999 as compared with costs on the continent, but the sow stall ban had contributed only 2p/kg. to this, whereas the strength of Sterling had contributed 22p/kg.

It is, moreover, important to note that any increase in on-farm production costs arising from the use of a higher welfare system will have a proportionately smaller impact on the retail price. For example, a 10% rise in on-farm production costs will lead to a significantly lower than 10% increase in the retail price. This is because on-farm production costs are only one of a range of factors which determine the retail price. Distribution and marketing are also significant components of the final price. For example, a rise in the price of petrol may well have more impact on the retail price of pork than whether sows are kept in stalls or groups.

Thus, for example, in their 2000 report on broilers, the European Commission's Scientific Committee on Animal Health & Animal Welfare (SCAHAW) stated that simulation models indicate that reducing maximum stocking density from 38 to 30 kg/m² and increasing growing time (i.e. reducing growth rate) by 10 days would each cause an increase in total production costs of about 5%. (Both of these would be welcome welfare improvements). SCAHAW adds that reducing stocking density from 38 to 25 and 20 kg/m² would cause increases in total production cost of about 10% and 15%, respectively. However, crucially, SCAHAW goes on to stress that such cost increases may be expected to increase final consumer prices by significantly lower percentages, i.e. by about 2.5% to 7.5% or less in processed products. This clearly illustrates the fact that a particular percentage increase in on-farm production costs should lead to a significantly smaller percentage increase in the retail price as the on-farm costs are only one component in the overall cost of producing food.

An alternative approach to the economics of farming

Over the last 40 years high input/high output farming has been the norm in Europe. A recent Dutch article, however, by *van der Ploeg (2000)* examines an alternative approach which he terms "farming economically" and which he refers to as "low-external-input agriculture". Here the strategy is to contain monetary costs on investments, loans and expenditure on external inputs. Central to this farming style is the use and development of internal resources.

van der Ploeg takes as an example of farming economically a Dutch dairy farm run by Mr Hoeksma and his two sons. The author argues that farming economically provides family farmers with a way of addressing the increasingly threatening situation of limited milk production quotas, decreasing prices, the high cost of land and milk quotas and the obligation to farm in an environmentally sound way. *van der Ploeg* compares Hoeksma's farm with a reference group of around 80 dairy farms.

Veterinary costs are low on Hoeksma's farm – Euro 38 per cow per year compared to Euro 67 for the reference farms. These low costs are related to a lower milk yield – 6,449 kg. compared to 7,526 kg. per cow – and higher labour input, which means that

more care is given to the animals. The lower milk yield reflects the fact that less industrial feed is used. Remarkably, high grassland production – 8,453 compared to 7,224 kVEM – is achieved despite the relatively restricted use of fertiliser (217 kg. of nitrogen per hectare compared to 300 kg.). This indicates high levels of technical efficiency. The costs of hired labour are also low due to the high labour input of Hoeksma and his sons.

In short, savings result from lower veterinary costs and reduced use of industrial feed, nitrogen fertiliser and hired labour. There are also significant differences as regards benefits. Because of the lower milk yield and the composition of feed and fodder, the fat and protein content of the milk produced on the Hoeksma farm is higher. Combined with a particular distribution of production over the year (winter milk gets a better price), this leads to a higher milk price. When the revenues from the sale of heifers and cows are also added, the total revenue on Hoeksma's farm comes to Euro 39.41 per 100 kg. of milk compared to Euro 34.42 for the reference group. The surplus, after deducting all costs except those associated with labour, is Euro 11.12 compared to Euro 5.23. Clearly this low-external-input approach can lead to significant savings and economic benefits.

Environmental and health costs

So far we have looked at on-farm production costs and have pointed out that in some cases improving welfare leads to only a small increase in production costs and in others it actually results in savings. It would, however, be erroneous to assume that we only pay for our food as consumers at the shop. When we also look at what we pay as taxpayers in CAP subsidies (of which more later) and in a variety of ways to clean up the environmental pollution and deal with the health problems associated with modern farming, we find that industrial agriculture is much more expensive than we think.

A recent study by *Pretty et al (2000)* calculates the total external environmental and health costs of modern agriculture in the UK to be £2,343 million per annum. The authors state that they believe their figures are a conservative estimate of the true costs. This study estimates two types of damage costs:

- i) the treatment or prevention costs; those incurred to clean up the environment and restore human health, and
- ii) administration and monitoring costs; those incurred by public authorities and agencies for monitoring environmental, food and health parameters.

Damage to water

Pretty et al (2000) point out that pesticides, nutrients (nitrogen and phosphorus), soil, farm wastes and micro-organisms escape from farms to pollute ground and surface water. Costs are incurred by the water delivery companies in cleaning up this pollution. *Pretty et al* estimate the total pesticide costs arising from farming to be £119.6 million per year.

They point out that nitrate enters drinking water sources from a variety of avenues including fertilisers and livestock wastes. They estimate that 80% of nitrogen is from agricultural sources, putting the annual expenditure by water companies on nitrate removal from agricultural sources at £16.4 million per year.

Phosphate also contaminates water, with some 43% estimated to come from agriculture: 29% from livestock and 14% from fertilisers. *Pretty et al* estimate the cost of dealing with phosphate contamination of water caused by agriculture and soil removal to be £52.3 million per annum.

Water companies have to remove some 50 zoonoses derived from livestock, wild animals and human sewage. *Pretty et al* point out that the most important agricultural contaminant is cryptosporidium; they estimate that the annual costs of removing cryptosporidium due to agriculture to be £22.5 million.

Pretty et al go on to point out that farm wastes further disrupt water systems: cattle and pig slurry, silage effluent, and dairy wastes cause eutrophication and toxic wastes (such as sheep dips) kill aquatic life. The authors estimate the cost of such water pollution arising from agriculture to be £1.14 - £2.35 million per year. There are no national data on the costs of eutrophication, although the remedial costs in reservoirs alone have been estimated to be £4 million per year.

Damage to air

Agriculture contributes to atmospheric pollution through the emission of four gases: methane from livestock, nitrous oxide from fertilisers, ammonia from livestock wastes and some fertilisers, and carbon dioxide from energy/fossil fuel consumption and loss of soil carbon. These gases contribute to atmospheric warming, ozone loss in the stratosphere, acidification of soils and water and eutrophication. *Pretty et al* estimate the annual external costs of these gases arising from UK agriculture to be £1,113 million.

Damage to soil

Modern farming has accelerated erosion due to a number of factors including overgrazing of animals on grasslands.

Damage to biodiversity and landscape

Modern farming has led to significant losses of wildlife (flora and fauna) and habitats.

Human health

Modern farming has a serious impact on human health and, in the case of BSE and FMD, also on animal health. Public Health Laboratory Service data show that food poisoning incidents rose to 94,000 per year in 1997, a 10-fold increase since the 1950's. Moreover, notified cases represent only a small proportion of the total cases of food poisoning as only 1 in 30 cases is notified.

Food poisoning entails costs in terms of lost production due to time off work and medical treatment. The total costs for food poisoning are estimated by *Pretty et al* to be £677 million per year. The authors conservatively assume that only 25% of food poisoning cases arise directly from UK farming.

Antibiotic resistance

Antibiotics are routinely used in industrial farming both as growth promoters and prophylactically to forestall the infectious diseases which would otherwise spread rapidly in the overcrowded, often unhygienic conditions of factory farming. The overuse of antibiotics on-farm has contributed to the development of bacteria which are resistant, not only to certain antibiotics used on-farm, but also to some used to treat serious human disease. The WHO has reported that antibiotic use on-farm has resulted in the emergence of resistant salmonella, campylobacter, enterococci and E.Coli types.

BSE and FMD

It is generally accepted that BSE arose from the intensive farming practice of feeding the remains of cattle and sheep to cattle, animals which are natural herbivores. This was a typical example of what we would term the “factory farming mentality” – feeding natural herbivores with the cheapest possible protein in order to increase yield/growth, whilst ignoring the inherently unnatural nature of the feed. The costs of dealing with BSE are estimated to be £4.4 billion. The total resulting cost to humans from nvCJD is as yet unknown.

It remains unknown as to how FMD entered the UK. It is, however, widely accepted that the modern practices of transporting animals long distances to slaughter and moving sheep several times in quick succession in and out of markets and other premises led to the very rapid spread of FMD. In June 2002, a report by the National Audit Office showed that the FMD epidemic cost the taxpayer £3 billion and cost business (tourism, leisure, etc.) £5 billion.

As indicated earlier, when the environmental pollution and detrimental health impacts on humans and animals associated with industrial agriculture are taken into account, that agriculture is revealed as being expensive. That said, we must address the fact that in some cases food from better welfare systems will cost more in the shops.

Need for changed approach by consumers and supermarkets

Clearly the challenge is to persuade consumers to pay the little extra needed so that animals can be kept in good systems. To some extent, people are already willing to do so; for example, the proportion of barn and free-range eggs has risen from around 10% of all eggs produced a few years ago to the present level of 28.3%. Much more, however, needs to be done by the industry, government and retailers to educate the public into understanding that our cheap food has come at a very high price in terms of animal suffering. CIWF believes that if consumers knew the true facts of modern farming – were aware of the tiny cages for hens and that many slaughter pigs are kept on slatted or concrete floors and knew of the serious health problems imposed on dairy cows and broilers by the drive to increase productivity – they would be willing to pay the small extra sums needed for improved welfare.

Unfortunately, the farming industry, government and retailers have all chosen to keep the public largely unaware of the state of modern animal farming. Much greater honesty needs to be followed by a broad public debate in which we as a society must decide whether or not we wish to move towards a better agriculture. CIWF hopes that we will decide to make changes, that we will accept that a responsible society should not treat animals as something placed in this world for our convenience, for us to use in whatever way we wish, but instead that we will accept that we have an ethical obligation to ensure that the animals we rear for food are treated humanely. Our well-being should not be founded on the suffering of other creatures. We hope the public will commit itself to ending the suffering that is systematically imposed on millions of animals in the name of cheap food.

CIWF advocates the adoption of a 'total chain' approach in which all of us – farmers, consumers, supermarkets, caterers, food manufacturers and Government – accept

our shared responsibility for achieving welfare reforms and work together in pursuance of this aim. However, although it forms only one part of the chain, it is Government which must take the lead in 'getting the ball rolling' in persuading all sectors to play a vigorous part in securing high welfare standards.

Supermarkets and the providers of fast food must be encouraged to act more responsibly. In their bid to make food ever cheaper, supermarkets have in effect driven farmers to use low welfare systems. Supermarkets must now adopt new policies designed to encourage farmers to improve welfare. This means setting high standards – and being prepared to pay a fair price to farmers who meet those standards. We welcome the decision by Marks & Spencers and Waitrose not to sell battery eggs (indeed Marks & Spencers only sell free-range eggs) and McDonalds' policy of only using free-range eggs. If all supermarkets and providers of fast food were to follow these leads – and indeed to adopt such policies across the board and not just for eggs – a major beneficial change in modern agriculture could be achieved. Food manufacturers too – for example, those who produce the readymade meals on which we increasingly rely – must also be prepared to play their part in setting high welfare standards – and paying a fair price to farmers who reach those standards.

Certainly it will be difficult for farmers to change without:

- i) Major changes of policy from supermarkets, the providers of fast food (see above) and indeed, food manufacturers and processors.
- ii) A change in the situation in which for every pound we spend in the shop now on food and drink, just 9p gets back to farmers and rural communities, whereas 50 years ago that figure was 50-60p in the pound (*Pretty, 2001*). While the profits of supermarkets continue to rise (the profits of the big 4 supermarkets rose 38% in the 4 years to 1999 (*Pretty, 2001*)), at the same time less and less money goes to farmers. This trend must be reversed if farmers are to be in a position to introduce better systems.

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