

WellBeing International

WBI Studies Repository

2003

The EU Ban on Battery Cages: History and Prospects

Michael C. Appleby

The Humane Society of the United States

Follow this and additional works at: https://www.wellbeingintludiesrepository.org/sota_2003



Part of the [Agribusiness Commons](#), [Animal Studies Commons](#), and the [Operations and Supply Chain Management Commons](#)

Recommended Citation

Appleby, M.C. (2003). The EU ban on battery cages: History and prospects. In D.J. Salem & A.N. Rowan (Eds.), *The state of the animals II: 2003* (pp. 159-174). Washington, DC: Humane Society Press.

This material is brought to you for free and open access by WellBeing International. It has been accepted for inclusion by an authorized administrator of the WBI Studies Repository. For more information, please contact wbisr-info@wellbeingintl.org.



The EU Ban on Battery Cages: History and Prospects

11

CHAPTER

Michael C. Appleby

Introduction

On June 15, 1999, the European Union (EU) passed a directive on the welfare of laying hens, requiring that battery cages (so called because they are arranged in batteries of rows and tiers) be phased out by 2012. Enriched laying cages (which may also be arranged in batteries but which provide increased area and height, when compared with conventional cages, and a perch, nest box, and litter area) will still be allowed. This chapter outlines how this directive came about, and the social, economic, and political issues involved. It considers prospects for the future, both within and outside the EU, and implications for welfare of laying hens in the United States.

The Council of Europe and the European Union

First it is necessary to explain the institutions involved. One influential grouping—little known, even in Europe—is the Council of Europe. The Council was established in 1949 to increase cooperation among nations; it represents most of the countries of Europe (the number was

forty four in 2002). Perhaps its most important activity is the preparation of conventions. The only one widely known is the European Convention on Human Rights, and most people assume that the EU produced it. One area in which the council has been active is animal welfare. Indeed it has stated that “the humane treatment of animals is one of the hallmarks of Western civilisation” (Appleby, Hughes, and Elson 1992). In 1976 it produced the Convention on the Protection of Animals kept for Farming Purposes. Though not legally binding on member countries until they ratified it, member countries accepted the responsibility to include the convention’s provisions in their national legislation. This convention will be considered later.

The EU, which has existed under a number of names, such as the European Community and the European Economic Community, started as a subset of the Council of Europe and now includes fifteen countries (Table 1). It has three key bodies. The European Commission is appointed by member countries to run the show, including drafting legislation. The European Parliament consists of members elected by constituents in each country; it shares with the

Council of Ministers the power to legislate. The Council of Ministers (sometimes called the Council of the EU but not to be confused with the Council of Europe) is the main decision-making body. It includes one representative from each country; a confusing feature, however, is that these representatives vary. For agricultural matters, the Council of Ministers consists of the ministers of agriculture from fifteen countries. A vital aspect of the Council is that its presidency is held for six months by each country in turn, and the presiding country takes most of the initiative for that period, often attempting to impose its own agenda. The United Kingdom presided for the first half of 1998. Germany presided for the first half of 1999. Both periods were critical in the course of the battery cage issue, as shall be seen.

The EU can enact regulations and directives, among other legislation. Regulations are binding throughout the EU and overrule any contradictory national legislation. Directives, by contrast, are not operative in the member countries. They direct each country to pass national legislation to put them into effect. This requirement is binding, so that countries will have at least the same minimum stan-

Table 1
Countries of the European Union and the System of Qualified Majority Voting Used by the Council of Ministers*

Country	Votes	Country	Votes
Austria	4	Italy	10
Belgium	5	Luxembourg	2
Denmark	3	Netherlands	5
Finland	3	Portugal	5
France	10	Spain	8
Germany	10	Sweden	4
Greece	5	United Kingdom	10
Ireland	3		
Total		87	
Required for Directive to be adopted		62	
Blocking minority		26	

*Number of votes is determined primarily by population.

Source: Council of the European Union 2003

dards (for example, the same minimum space allowance for hens in cages). It has to be said, though, that when countries are unenthusiastic about directives they may delay passing legislation as long as possible and skimp on the details. If they wish, countries may legislate for higher standards within their own borders—for example, a greater space allowance in cages—but they cannot generally restrict imports of related products from other member countries—such as eggs produced more cheaply. (For one exception, see the section on page 164 on Sweden.) For regulations and directives, the mechanism is as follows: The Commission drafts legislation, either on its own initiative or when requested to do so by the Council. The Parliament may amend the draft. The Council amends it further and passes or rejects the final version, with joint authority from the Parliament. On matters such as those of concern here, this decision is made by “qualified majority,”

with votes weighted by countries’ populations (Table 1).

The emergence of these complex structures is in large part accounted for by the diversity of the countries of Europe, and all that this has meant historically and politically. That diversity is further reflected in attitudes about animals.

Attitudes about Animal Welfare

It is well recognized that concern for animal welfare varies across Europe, being generally stronger in the north—particularly the United Kingdom, the Netherlands, Germany, and Scandinavia—and weaker in the south. Reasons are complex. A number of factors correlate with this variation, including temperature (it is hotter in the south, which affects how animals are kept) and religion (Catholicism is commoner in the south, Protestantism in the north,

and this affects attitudes). The most persuasive explanation, though, is that concern has developed largely in people who were less involved with animals than were others. The United Kingdom and the Netherlands, for example, are more industrialized than many other countries, and pressure for animal protection has come mostly from city dwellers rather than those involved in farming. A revealing snapshot was provided in 1981 by a review of which countries had then ratified the Council of Europe’s 1976 Convention on the Protection of Animals kept for Farming Purposes (Table 2). Of the twenty-one member countries, most of the eleven that ratified first were from the north and had an average of only 6 percent of the population involved in agriculture. Switzerland is relatively southern but also relatively industrialized and ratified early, along with northern nations. Countries that ratified later had a population average of 21 percent involved in agriculture. Most of these countries were southern. Though a northern country, Ireland was in this group, too, and 23 percent of its population was involved in agriculture. The north-south dichotomy may have reflected not only differences in attitude but also the fact that, where many people are engaged in agriculture, governments are unwilling to impose restrictions that may affect their livelihood. Indeed, the agricultural industry has always been particularly vociferous and effective in lobbying for its interests.

It is relevant to note that priorities other than animal welfare may also influence welfare, and that such priorities also vary among countries. Norway, for example, has legislation to limit farm size because it regards rural employment as important, and this limitation probably has some benefits for animal welfare. France puts emphasis on food quality, which also has some positive effects: many people believe that non-cage eggs taste better, and some of these eggs are probably bought in France for this reason.

In recent years concern for animal

welfare has grown in southern Europe, as indicated by public opinion polls. There is public sympathy for high-profile campaigns by celebrities such as Brigitte Bardot, and scientists and scientific bodies have increased their interest in, and support for, animal welfare research. The story that follows is, therefore, not simply one of the north outvoting the south or browbeating it into agreement. However, southern governments do continue to be less positive than northern governments about animal welfare (Sansolini 1999a).

Publication of Ruth Harrison's *Animal Machines* in the United Kingdom in 1964 had a huge, international impact. It greatly increased awareness of factory farming methods, including battery cages, and concern for farm animal welfare. The U.K. government set up the Brambell Committee (which issued a report in 1965), passed the Agriculture (Miscellaneous Provisions) Act in 1968, and established an independent Farm Animal Welfare Council (FAWC). Both the Brambell Report and FAWC have had an international influence, too, including their development of the concept of Five Freedoms (Table 3).

Table 2
Ratification of the Council of Europe's 1976 Convention on the Protection of Animals Kept for Farming Purposes by 1981, and the Proportion of Each Country's Population Involved in Agriculture

Ratified	Agricultural Labor (percent)	Not Yet Ratified	Agricultural Labor (percent)
Belgium/Luxembourg	4	Austria	9
Cyprus	—	Greece	30
Denmark	8	Iceland	9
France	9	Ireland	23
Netherlands	5	Italy	12
Norway	8	Liechtenstein	—
Sweden	5	Malta	5
Switzerland	5	Portugal	26
United Kingdom	2	Spain	17
West Germany	4	Turkey	54
Average	6		21

Source: Ludvigsen et al. 1982

Table 3
The Five Freedoms*

Animals should have:

Freedom from hunger and thirst	by ready access to fresh water and a diet to maintain full health and vigour
Freedom from discomfort	by providing an appropriate environment, including shelter and a comfortable resting area
Freedom from pain, injury and disease	by prevention or rapid diagnosis and treatment
Freedom to express normal behaviour	by providing sufficient space, proper facilities, and company of the animal's own kind
Freedom from fear and distress	by ensuring conditions and treatment which avoid mental suffering

*The concept originated from a phrase in the Brambell Report (Brambell 1965) and was developed by the U.K. Farm Animal Welfare Council (1997)

Brambell Report: Farm animals should have freedom "to stand up, lie down, turn around, groom themselves and stretch their limbs."

Source: FAWC

Housing Systems for Laying Hens

Another important development in the United Kingdom and elsewhere, beginning in the mid-1970s, was work on alternatives to battery cages. In the developed world, by about 1970 most hens kept for egg production (called laying hens or layers) were housed in conventional laying cages or battery cages. It is widely acknowledged that battery cages cause many welfare problems. They compromise most or all of FAWC's Five Freedoms, and indeed contravene the very limited "freedoms" listed in the Brambell Report (Table 3). Work on alternative housing systems, primarily aimed at reducing welfare problems, was most active in the 1970s and 1980s.

Much of this work was funded by national governments in northern Europe. The main emphasis was on use of non-cage systems such as deep litter, straw yards, and free range in the United Kingdom (Appleby et al. 1988; Gibson, Dun, and Hughes 1988; Keeling, Hughes, and Dun 1988); slatted floors in Denmark (Nørgaard-Nielsen 1986); and tiered wire floors in the Netherlands (Ehlhardt and Koolstra 1984). There also was work in the United Kingdom and Germany on a modified cage called the Get-away cage (Elson 1981; Wegner 1990). However, all these systems have one major welfare problem that battery cages do not. Birds in these facilities have to be beak-trimmed—a mutilation that has become increasingly controversial—otherwise cannibalism is likely, often affecting a high percentage of birds. The cannibalism apparently is related to group size, which in all these systems is larger than in battery cages.

Therefore, work began in the mid-1980s, in Edinburgh and elsewhere, on modifying cages for small groups. What have come to be called enriched or furnished cages provide increased area and height compared with conventional cages, and also a perch, a

nest box, and a litter area. The term *furnished cages* probably is best, because it is descriptive rather than judgmental (Appleby et al. 2002), but the EU 1999 directive refers to *enriched cages*, so that term will be used here. The author suggests that welfare is improved in enriched cages, and more reliably so than in alternative approaches such as percheries and free range systems (Appleby 1993). This argument is still controversial and unfamiliar to the public. The public tends to think that "free range" means small, farmyard flocks, whereas commercial free range systems house hundreds or thousands of hens. Such conditions have numerous problems, including—to emphasize the point—the fact that unless part of the birds' beaks is amputated, the birds often peck each other to death.

Other important work on improving cages included that of scientist Ragnar Tauson in Sweden. He surveyed the incidence of trapping and injury of caged hens (Tauson 1985). This led to design of improved cages, use of which resulted in reduction in incidence (Tauson 1988). Tauson also developed an abrasive strip which, when attached to the egg guard behind the food trough, prevents overgrowth of claws (Tauson 1986).

Beginning in 1979 the EU financed

background scientific work on poultry welfare in a "farm animal welfare co-ordination program." The author was employed under this program starting in 1981 (Appleby 1983). Another important effort has been the series of European symposia on poultry welfare held by the World Poultry Science Association every four years; the first symposium took place in 1981 (following a predecessor in Denmark in 1977), and the sixth was in Switzerland in September 2001.

Two problems arose in general understanding of the production methods used. First, systems were given a bewildering variety of names—those already listed as well as aviaries, percheries, and others—and, second, systems had no official specifications. Eggs sold as free range, for instance, might come from hens allowed to "range" only inside a house or only if they could find one small exit from a huge building. The EU addressed these problems in 1985 by imposing a regulation defining four labels that can be put on eggs and the corresponding conditions in which hens must be kept (Table 4). In the absence of one of those labels, eggs are presumed to come from cages. This regulation immediately slowed the name-changing and had a

Table 4
Criteria Defined by the EU for Labeling of Eggs

Label	Criteria
Free range	Continuous daytime access to ground mainly covered with vegetation Maximum stocking density 1,000 hens/hectare
Semi-intensive	Continuous daytime access to ground mainly covered with vegetation Maximum stocking density 4,000 hens/hectare
Deep litter	Maximum stocking density 7 hens/m ² A third of floor covered with litter Part floor for droppings' collection
Perchery or barn	Maximum stocking density 25 hens/m ² Perches, 15 cm for each hen

Source: Commission of the European Communities 1985

big impact on how non-cage hens are kept. For example, there are no laws in any EU country on maximum floor stocking rates but to get a premium for deep litter eggs a producer must not exceed seven hens per square meter. Exceeding the limit means selling the eggs unlabeled, at a loss.

The battery cage system is the least costly approach in use for egg production (Table 5). However, over the same period, in the 1970s and 1980s, a market for non-cage eggs was developing. Some people, again particularly in the north of Europe, will pay more for such eggs either because they are concerned about the welfare of hens or because they perceive the eggs to be more nutritious, tasty, or healthful. Thus some producers continued to keep hens in non-cage systems, covering the higher cost with a higher selling price for the eggs. No full economic analysis of enriched cages has been published, but egg production probably costs around 10 percent more from these than from battery cages (Appleby 1998). This is cheaper than using most non-cage systems, but since eggs from enriched cages cannot be given any of the labels in Table 4, shoppers cannot distinguish them from battery eggs. As a result farmers will not use enriched cages unless required to do so by law.

Egg labels often confuse customers. Many people think (or perhaps hope) that eggs sold under names that sound appealingly rural or wholesome do not come from cages, but such brand names actually have no official status. About 20 percent of eggs sold in the United Kingdom do come from non-cage systems, either free range or barn. In the Netherlands, Germany, and Denmark, deep litter eggs (which are called “scratching eggs” in their languages) are more popular. In recent years, some supermarkets in northern Europe have responded to customer concerns by labelling eggs from caged hens as such. The EU as of 2002 was moving toward making this labelling mandatory.

Table 5
Cost of Egg Production in Different Systems, Relative to Laying Cages with 450 Square Centimetres Per Bird

System	Space	Relative Cost (%)
Laying cage	450 cm ² /bird	100
Laying cage	560 cm ² /bird	105
Laying cage	750 cm ² /bird	115
Laying cage	450 cm ² /bird + nest	102
Shallow laying cage	450 cm ² /bird	102
Get-away cage	10–12 birds/m ²	115
Two-tier aviary	10–12 birds/m ²	115
Multi-tier housing	20 birds/m ²	105–108
Deep litter	7–10 birds/m ²	118
Strawyard	3 birds/m ²	130
Semi-intensive	1,000 birds/ha	135 (140 including land rental)
Free range	400 birds/ha	150 (170 including land rental)

Source: Elson 1985

Space refers in cages to cage floor area, in houses to house floor area, and in extensive systems to land area

Developments in Individual Countries

Animal welfare legislation in individual European countries shows a dichotomy that reflects differing attitudes. Northern countries have detailed laws, with codified lists of actions that are prohibited. Southern countries tend simply to state that animals must not be ill-treated. Legislation also is enforced more strictly in some countries than in others.

Several northern countries have passed legislation or made other changes over the last half century that have affected the welfare of caged hens both within and outside their borders. This section considers Denmark and the United Kingdom (both of which joined the EU in

1973), Sweden (which joined in 1995), and Switzerland (which is not a member).

Denmark

In 1950 Denmark passed a comprehensive Protection of Animals Act, which stated (T. Ambrosen, University of Copenhagen, personal communication, May 16, 2001) that:

Animals must be properly treated and must not be neglected, overstrain or in any other way be subject to unnecessary suffering; Anyone keeping animals should see that they have sufficient and suitable food and drink, and that they are properly cared for in suitable accommodation.

This language was interpreted as prohibiting battery cages, so there were no cages in Denmark for many years. However, Danish companies

started building farms over the border in Germany and bringing the eggs to Denmark. By the 1970s the law was being flouted with impunity: battery cages were being installed in Denmark and even supported by government grants. A compromise was reached in 1979, when a new law was passed that allowed cages, but with a minimum area of 600 square centimeters per bird. In a typical cage of 2,500 square centimeters, this meant housing four instead of five birds. Denmark became a net importer of eggs rather than a net exporter, but the Danish egg industry survives, even if smaller than before.

United Kingdom

The U.K. Agriculture (Miscellaneous Provisions) Act of 1968 had important provisions in addition to those already mentioned, particularly a requirement to produce Codes of Recommendation for the Welfare of Livestock. Contravention of these is not a legal offense in itself but can be used as evidence in prosecution for cruelty. (In the same way, breaking the better-known Highway Code by driving on the wrong side of the road is not illegal but would be evidence in a prosecution for dangerous driving.) The 1969 Code for domestic fowls stated:

In cages holding three or more lightweight birds, the floor area should normally allow not less than 1 sq m per 39.1 kg live-weight. For heavier birds the allowance should not normally be less than 1 sq m per 44 kg live-weight. (Ministry of Agriculture, Fisheries, and Food 1969, 5)

Strains of heavier brown hens were becoming common in the United Kingdom by 1969, and they soon became ubiquitous. This was an interesting result of consumer preference: people bought brown eggs (which come from brown birds) even though they cost more, because the eggs were perceived to be tastier or more natural than white ones (which come from white hens). Brown birds weighed about 2.5 kilograms by the

end of the laying year, so they ought to have been given more than 550 square centimeters of living space. They probably had about 500 square centimeters, corresponding to a body weight of 2.2 kilograms.

In the late 1970s, the U.K. Parliament set up a Select Committee on Agriculture, whose members chose to consider animal welfare before anything else. They produced a report in July 1981 concluding that:

Agreement should be sought in the European Community to a statement of intention that after, say, five years egg production will be limited to approved methods which will not include battery cages in their present form. . . . This should be pursued during the UK Presidency. . . . Meanwhile the Minister should seek Community agreement to a minimum standard for adult laying birds in battery cages of not less than 750 sq cm per bird. He should refuse to agree to anything less than 550 sq cm. (House of Commons 1981, 53)

The proposal for a ban on battery cages received widespread publicity, but the timing was poor. The United Kingdom had just started a six-month term as president of the Council of the EU, and it was too late for the detailed preparation that the battery cage action would have needed. Perhaps partly for this reason, the proposal was not taken up by the U.K. government.

The U.K. Farm Animal Welfare Council (FAWC) also arose from the 1968 Act, and it has produced a succession of influential reports. These include an assessment of egg production systems (1986), a report on the welfare of laying hens in colony systems (1991), and a report on the welfare of laying hens (1997).

Sweden

In 1988, at a time when Sweden perhaps did not expect to join the EU, the country passed a new Animal Welfare Act. This required that, starting in 1989, all new cages should provide 600 square centimeters per hen. The country also took account of Tauson's work (mentioned above), mandating, for example, that by 1994 all cages should be fitted with a claw-shortening system and a perch. More radical change was to follow (R. Tauson, Swedish Agricultural University, personal communication, August 20, 2000):

Animals should be able to perform natural behaviours and be protected against disease and unnecessary suffering;

Hens for egg production should not be kept in cages from 1999,

But alternatives must not mean

Impaired animal health,

Increased medication,

Introduction of beak trimming or

Impaired working environment.

Despite the ban on cages, remarkably little was done on alternative systems in the next few years, by either the government or the industry, and the industry suggested that the required conditions would be "difficult, if not downright impossible to meet" (Fredell 1994, 1). More than 40 percent of producers said they would leave egg production and predicted that imports would rise to more than 60 percent (Sörensen 1994).

Tauson agreed that the required conditions were inconsistent with a cage ban, and started work on enriched cages in collaboration with this author (Abrahamsson, Tauson, and Appleby 1995). In 1997 Sweden accepted the industry's arguments and deferred implementation of the ban, requiring instead that all cages be enriched. (By then Sweden was in the EU.) A ban on cages remains on the statutes but in abeyance; enriched cages were introduced in Sweden on a large scale beginning in 1998 (Tauson 2000; Tauson and Holm 2001).

The actual threat from imports was not as great as the industry claimed. Restrictions on imports are not generally allowed within the EU. However, the Swedish egg industry is almost free of salmonella, so that Sweden can refuse imports from countries with salmonella—including the rest of the EU, apart from Finland.

Switzerland

Switzerland is the only country in the world to have banned laying cages. The ban was imposed in 1992, after a 1978 referendum in which citizens were informed of the economic consequences of the proposed action. Not being in the EU, Switzerland can restrict imports of cheaper eggs. Some imports are permitted, though, despite the fact that they come from systems that are illegal in Switzerland, because the country's egg production is insufficient to meet demand.

The Swiss law is framed as a ban on any enclosure for fewer than forty birds. Various designs based on the Dutch tiered-wire floor systems are used (Matter and Oester 1989). Performance of these, and the welfare of the birds, were relatively poor at first

but have improved with experience (Fröhlich and Oester 2001).

The 1976 Convention and the 1986 Directive

From the late 1970s on, an underlying influence on poultry welfare was the Council of Europe's 1976 Convention on the Protection of Animals Kept for Farming Purposes. As mentioned above, once members ratified the convention they were obliged to take it into account in their countries—and that included all the countries in Table 2, except Turkey (which still has not ratified). It also includes other countries that subsequently joined the council. The convention was concerned with the care, husbandry, and housing of farm animals, especially those in intensive systems (Table 6). Its recommendations are couched in general terms, but the drafting committee commented that it tried to lay down principles precise enough to avoid a completely free interpretation, yet wide enough to

allow for different requirements. Because the convention itself is very broad, the Council of Europe has a standing committee with a responsibility for elaborating more specific requirements. One of the first areas in which it became active was that of poultry welfare.

In addition to individual countries, the EU became a party to the convention in 1978. Not surprisingly, the EU decided it should act on the welfare of laying hens. After several years of negotiation, an EU directive was adopted in 1986 which establishes minimum standards for the protection of hens in battery cages (Commission of the European Communities 1986). By January 1988 all newly built cages had to provide 450 square centimeters of space per hen and meet other requirements (Table 7); these standards were to apply to all cages by January 1995.

In hindsight the directive seems minimalist to many in Europe. However, it was one of the first Europe-wide statutes that actually specified how animals were to be kept. Prior to this approximately half the hens in Europe were given less than 450 square centimeters each, and probably few cages in Europe met all the

Table 6
Extracts from the Convention on the Protection of Animals Kept for Farming Purposes

Article 3 states: Animals shall be housed and provided with food, water and care which—having regard for their species and to their degree of development, adaptation and domestication—is appropriate to their physiological and ethological needs, in accordance with established experience and scientific knowledge.

Article 4 states: The freedom of movement appropriate to an animal, having regard to its species and in accordance with established experience and scientific knowledge, shall not be restricted in such a manner as to cause it unnecessary suffering or injury. Where an animal is continuously tethered or confined it shall be given the space appropriate to its physiological and ethological needs.

Article 5 deals with lighting, temperature, humidity, air circulation, ventilation and other environmental conditions such as gas concentration and noise intensity.

Article 6 deals with the provision of food and water.

Article 7 deals with inspection, both of the condition and state of the animal and of the technical equipment and systems.

Source: Council of Europe 1976

Table 7 Extracts from the EU 1986 Directive Laying Down Minimum Standards for the Protection of Laying Hens Kept in Battery Cages

A minimum area of 450 cm² per bird and 10 cm of feeding trough per bird

A continuous length of drinking trough providing at least 10 cm per bird or if nipple drinkers or drinking cups are used, at least two shall be within reach of each cage

Cage height of at least 40 cm over 65 percent of the cage area and nowhere less than 35 cm

Cage floors capable of supporting adequately each forward-facing claw and not sloping more than 8 degrees, unless constructed of other than rectangular wire mesh

Source: CEC 1986

criteria specified for area, feeding space, height, and floor slope. The governments of southern Europe resisted inclusion of a space allowance as high as 450 square centimeters, agreed to this provision reluctantly, and subsequently implemented it slowly. However, all members of the EU did have to translate the directive into national legislation. In the United Kingdom, for example, this was done in 1987. The United Kingdom also amended its Welfare Code to recommend only the legal minimum of 450 square centimeters (Ministry Of Agriculture, Fisheries, and Food 1987). Denmark and Sweden, by contrast, continue to provide more than the minimum.

Developments Leading to the 1999 Directive

One further provision of the directive raised the possibility of future changes, for example a ban on cages, by saying that:

Before 1 January 1993 the Commission shall submit a report on scientific developments regarding the welfare of hens under various systems of rearing. (Commission of the European Communities 1986, 3)

The Scientific Veterinary Committee (Animal Welfare Section) of the commission did produce a report in 1992 (de Wit 1992), but it did not receive widespread circulation or pub-

licity and the commission took no direct action on it. In that same year, however, the commission issued a draft for a new directive (Commission of the European Communities 1992) which surprised everyone by recommending that cages should provide 800 square centimeters of area and 20 centimeters of perch per hen. A minimum height of 50 centimeters was included, with a height of at least 60 centimeters over 65 percent of the area. This was generally interpreted as "testing the water" rather than a serious proposal, and no mention of 20 centimeters of perch or 60 centimeters of height was ever seen again—although requirements for 800 square centimeters of area and 50 centimeters minimum height were retained to the next stage.

Meanwhile much relevant research continued. For example, in 1989 Dawkins and Hardie reported that brown hens take up 475 square centimeters just standing still and 1,272 square centimeters simply turning around.

By 1995 the commission had decided that it had to take further action, and asked the Scientific Veterinary Committee to update its report. The updated report, issued in 1996, listed welfare benefits and deficiencies of cages and non-cage systems. It concluded that:

Because of its small size and its barrenness, the battery cage as used at present has inherent severe disadvantages for the welfare of hens. . . .To retain the advantages of cages and over-

come most of the behavioural deficiencies, modified enriched cages are showing good potential in relation to both welfare and production. . . .Mainly because of the risk of feather pecking and cannibalism, [non-cage] systems have severe disadvantages for the welfare of laying hens. (109)

In the first half of 1998, the United Kingdom held presidency of the council and was pressing for change. That March the commission brought out another proposal for a new directive. The proposal was oddly framed, however, requiring hens to be provided with nests and litter but stating that:

Member states may authorise derogation from [those requirements] in order to permit the use of battery cages if the following conditions are met:

- (a) At least 800 cm² of cage area . . . shall be provided for each hen;
- (b) Cages shall be at least 50 cm high at any point. (Commission of the European Communities 1998, 5)

Enriched cages, "equipped with litter, perches, and a nestbox," were mentioned as a possible housing system; they were required to be 50 centimeters high but no more than that.

Then a critical coincidence occurred: Sweden started introducing enriched cages on a commercial basis. In late 1998 a number of key players in the Council of Ministers and the Commission's Directorate-General for Agriculture were able to

visit Sweden and see the cages for themselves. They doubtless took note of the fact that egg production from enriched cages is cheaper than from most non-cage systems.

Meanwhile Germany, hungry for substantial progress on animal welfare during its forthcoming presidency of the council in the first half of 1999, was gearing up to ensure adoption of the directive in that period. The German presidency—that is, the German ministry of agriculture, with support from the rest of the German government—recognized that the proposed directive did not give enough details of enriched cages for these to be properly regulated. They put forward an amended version in early January. This avoided the words *battery* and *enriched* altogether, and said that:

All cage systems [must] comply at least with the following requirements:

- (a) Where the cage contains eight hens or more, at least 550 cm² of cage area... must be provided for each hen;
- (b) Where the cage contains fewer than eight hens, at least 800 cm² of cage area must be provided for each hen....
- (f) Cages must also provide: a nest and an area with or without litter enabling hens to peck and scratch. (Commission of the European Communities 1999a, 7)

In other words, they proposed to ban battery cages, but not enriched cages.

The European Parliament—which, it will be remembered, is the directly elected, democratic body representing the public throughout the EU—debated the proposed directive in late January 1999. In the convoluted political process that constitutes the EU, the version it debated was that first proposed, not the version amended by Germany. However, the members of Parliament were aware of the German initiative and most of them

agreed with it. The Parliament amended the first version of the directive, voting heavily to replace the derogation for battery cages with a provision that “the use of battery cages shall be prohibited”: the vote was 58 percent for, 38 percent against, 4 percent abstaining. The increasing concern for animal welfare among southern Europeans may be illustrated by the fact that the amendment was presented by an Italian member of the Parliament and signed by Italian and Greek members, among others (Sansolini 1999b). The Parliament did not delete the mention of enriched cages as a permissible system, though. Thus it, too, voted to ban battery cages but not enriched cages.

This was the first stage of the debate to hit the headlines, making the front page at least in the poultry and animal welfare press, if not in the popular media. The coverage emphasized that the European Parliament had voted to ban batteries. But the most important stage was still to come. The final decision would be taken by the Council of Ministers. Strictly speaking, the decision might not be completely final. If the Council did not act as the Parliament wanted, the Parliament could then require it to think again—as it did recently when the Parliament voted to ban sales of cosmetics tested on animals and the Council demurred. However, the Parliament might well not have persisted, so the Council decision would be momentous.

The 1999 Directive

The next months were busy. Governments put the proposals out for consultation—for example, the author was on the list of those consulted by the U.K. government. Lobbying intensified because the Council would be using qualified majority voting (Table 1) so that, if several countries voted against the directive, it would fall. Indeed, the directive probably would not even reach a vote because,

although the Council does not need unanimity, it attempts to achieve it, rather than forcing minority countries to accept change against their will. If several countries were known to be planning to vote against the directive, the Council probably would have deferred the vote and considered further amendments.

Those thought most likely to vote against were France, Greece, Italy, Portugal, and Spain; these countries have a total of 38 votes, more than the 26 needed for a blocking minority. Portugal, for example, stated publicly that it planned to vote against (Aguirre y Mendes 1999). Groups supporting the ban, such as Eurogroup for Animal Welfare and Compassion in World Farming (CIWF), were particularly active in lobbying those five countries but also lobbied countries thought to be in favor—to ensure their continued support and to persuade them to put pressure on the possible dissenters. The action that received most publicity was a hunger strike by Adolfo Sansolini, the Italian head of Compassion in World Farming’s campaign in Mediterranean countries. On May 20, 1999, Italy announced that it would support the ban (Sansolini 1999b).

Details of the negotiations among the EU ministers of agriculture are, of course, not public. It is possible that some who opposed the ban finally agreed to support it in return for some other political favor. Stories have circulated that they were warned that, if the directive failed, there would be increased pressure for more radical change, such as a complete ban on cages. It also happened that the final vote came just after a discussion on the dioxin scandal (Commission of the European Communities 1999b), which is rumored to have diminished any trust that the agricultural industry could be left to regulate itself. (Not long before, there had been a widespread problem in Belgium of dioxin contamination of animal feed, leaving toxic residues in the carcasses after slaughter.) Serendipity may well have played some part in the vote. However, it can also be said

that this was a vote whose time had come.

On June 15, 1999, thirteen of the fifteen countries voted for the directive (Compassion in World Farming 1999). Only Austria voted against, and it did so because it did not believe the directive went far enough. Spain abstained.

The key provisions of the directive are shown in Table 8. It will phase out barren battery cages by 2012, with an interim measure requiring 550 square centimeters per hen by 2003. All new cages starting in 2003 and all cages starting in 2012 must provide 750 square centimeters per hen, as well as a nest box, a perch, and a litter area for scratching and pecking. Requirements for non-cage alternatives also change. Litter is not currently required in percheries (Table 5), but as of 2007 it will be needed in all houses. (The situation will be reviewed before the end of 2004.)

Not surprisingly, given the complex process leading up to the directive and the various forms it went through, there was confusion for some time about exactly what had been decided. Headlines were along the lines of "Battery Cages Banned." As many people, even within industry and welfare groups, were unaware of the existence of enriched cages or gave them little thought, they believed that cages had been prohibited altogether. The situation was clarified to some extent by articles such as that by Elson (1999), entitled "Laying Cages to be Enriched, Not Banned," but it still is not clear what actually will happen on most commercial farms, as shall be seen below.

Commentary

Welfare groups enthusiastically welcomed the directive. Compassion In World Farming (1999), for example, called it a "huge victory for animal welfare." However, the groups are unenthusiastic about enriched cages. Peter Stevenson (2001a) of Compassion In World Farming calls on the industry not to install these, but instead to move to non-cage systems.

The Royal Society for the Prevention of Cruelty to Animals (RSPCA) (undated [a], 9) says that "as more producers become familiar with the design and management of alternative systems, enriched cages offer few benefits." The RSPCA's Freedom Foods standards do not allow cages. The group does not mention the problems of beak trimming, cannibalism, and occupational safety in alternative systems. In this context, the EU Scientific Veterinary Committee report may be recalled; it described both battery cages and non-cage systems as having severe welfare disadvantages but said that modified enriched cages had good potential for both welfare and production (Scientific Veterinary Committee 1996).

Perhaps the most important point is that it seems extremely unlikely that a complete ban on cages would have been possible in the EU in 1999 or the foreseeable future. Such a ban would have faced the arguments that caused Sweden to defer its own ban in 1997—arguments that there would be problems in both practical and welfare terms. It also would have been much more difficult for the countries of southern Europe to accept a change that would have had even more economic impact; some of the northern countries might also have rejected such a change. Finally, the Council of Ministers may believe that the EU can protect an industry shouldering 10 percent cost increases against competition from the rest of the world, but it probably would have balked at a higher cost increase.

There is, therefore, a strong case that it was the availability of enriched cages as a viable system that enabled the ban on battery cages to be accepted. Some commentators suggest that enriched cages will not be economically competitive with non-cage alternatives (Compassion in World Farming 1999) and thus will never be common commercially outside Sweden. Even if that is true, however, the cages have moved the issue forward. Germany decided in 2001 that, in the context of a Europe-wide phasing out of battery

cages, it will disallow enriched cages within its own borders, producing a situation similar to that in Switzerland. This is despite Germany's part in promoting the directive, including its provision for enriched cages. The Netherlands and the United Kingdom are considering similar moves (Department for Environment, Food and Rural Affairs 2002).

What was the egg industry's response to passage of the directive? It was horrified. In the United Kingdom, egg producers met on June 15, the very day of the decision, and "as details of the directive were revealed, they were received with a stunned silence" (Cruikshank 1999). A September meeting of the International Egg Commission, representing thirty-three countries, including all of the major producing countries except China, resolved to raise \$1 million for action to overturn the ban. The resolution was supported by countries worldwide, including the United States. One reason must have been solidarity in face of what was perceived as a direct attack on the European members; in addition, "a domino effect is feared by the United States, Canada, and Australia" (Farrant 1999).

The industry may have been encouraged in the hope that it could overturn the ban by the complex circumstances leading up to the vote. Ben Gill, president of the U.K. National Farmer's Union, wrote to the U.K. Minister of Agriculture describing the changes as "ill thought through" (Cruikshank 1999). However, the complexities should not be taken as indicating that Europe was half-hearted on this measure. Such a negative conclusion is denied by the strength of the vote in Parliament and by the fact that fourteen of fifteen ministers voted for or wanted the ban.

At least since publication of *Animal Machines* in 1964, "Ban the Battery Cage" has been one of the most common protest calls. In the twentieth century, it probably was surpassed as a popular cause by very few others, such as "Votes for Women" and "Ban the Bomb." Ruth Harrison lived to see

Table 8 Extracts from the EU 1999 Directive Laying Down Minimum Standards for the Protection of Laying Hens

Un-enriched (conventional) Cages

From 1st January 2003 no new conventional cages may be brought into service and existing cages will have to provide 550 cm² per bird and a claw shortener

From 1st January 2012 conventional cages are prohibited

Enriched Cages

From 1st January 2002 enriched cages must provide:

- 750 cm² per bird, of which at least 600 cm² is at least 45 cm high
- A minimum total cage area of 2,000 cm²
- A nest
- Litter such that pecking and scratching are possible
- 15 cm perch per hen
- 12 cm of food trough per hen
- A claw shortener

Alternative Systems

From 1st January 2002 new non-cage systems must have:

- A maximum of 9 hens per m² of usable area
- Litter occupying at least one third of the floor
- 15 cm perch per hen

From 1st January 2007 all non-cage systems must comply with these conditions

Review

By 1st January 2005 “the Commission shall submit to the Council a report, drawn up on the basis of an opinion from the Scientific Veterinary Committee, on the various systems of rearing laying hens, and in particular on those covered by this Directive, taking account both of pathological, zootechnical, physiological, and ethological aspects of the various systems and of their health and environmental impact.

“That report shall also be drawn up on the basis of a study of the socio-economic implications of the various systems and their effects on the Community's economic partners.

“In addition, it shall be accompanied by appropriate proposals taking into account the conclusions of the report and the outcome of the World Trade Organisation negotiations.”

Source: Commission of the European Communities 1999c

the directive passed (and, characteristically, immediately started considering how it could be improved), but died in 2000. If full implementation of the directive is achieved by 2012, as planned, it will be forty-eight years after *Animal Machines* fired the indignation of the European public. Taking half a century to achieve just one of the changes called for in that book, and arguably only partially at that, is hardly rushing things.

Immediate Developments

What happens next obviously will be affected by the timing and content of the EU Scientific Veterinary Committee's review and the subsequent Commission report (Table 8).

Installation of non-cage systems probably will increase slowly in the short term. Those who are ahead of the game will get premiums for their

egg sales for the next few years.

Various manufacturers are offering models of enriched cages, and research on design details is in progress. The U.K. Ministry of Agriculture, for example, commissioned research on cage height, group size, and space allowances with the intention of making the results available to the Scientific Veterinary Committee's review in 2003 or 2004. However, few enriched cages will be installed outside Sweden before the Commission report is out.

No doubt producers continued to install conventional cages right up to December 2002. Some used models that are convertible to enriched cages; for example, a model of this kind is sold by Big Dutchman, the largest European cage manufacturer. Others used standard models, taking the risk that they will be usable only until 2011 (J. Campbell, Glenrath Eggs, personal communication, March 15, 2001), or perhaps a while

longer if the directive's deadline is not strictly enforced.

The review will consider performance of different systems (including enriched cages in Sweden) and their “socio-economic implications,” together with “the outcome of the World Trade Organization negotiations” (Table 8). So the latter must be considered next.

World Trade Organization Rules

Negotiations are under way to extend the rules for free trade established by the World Trade Organization (WTO) to agricultural products, preventing individual countries and trade zones such as the EU from limiting imports, subsidizing exports, or applying any other process that favors domestic versus foreign producers. The EU pro-

poses that animal welfare be taken into account in trade, by allowing labelling; agreements between trading partners that safeguard welfare; or payment of subsidies to producers who maintain high welfare (European Communities 2000). This will meet resistance from other countries, including the United States. However, it is possible that welfare can be taken into account even under existing WTO rules. Article XX of the WTO's General Agreement on Tariffs and Trade says (Stevenson 2001b, 13):

Nothing in this agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:

- a) necessary to protect public morals,
- b) necessary to protect human, animal or plant health.

The possibility of using this article to justify measures within the EU to protect animal welfare has not yet been fully explored. This possibility is strengthened by the fact that the United States recently used similar arguments to justify a ban on trade of dog and cat fur (United States Congress 2000). The act's preamble states (Stevenson 2001b) that:

The trade of dog and cat fur products is ethically and aesthetically abhorrent to U.S. citizens;

[The] ban is also consistent with provisions of international agreements to which the United States is a party that expressly allow for measures designed to protect the health and welfare of animals:

[U.S. consumers have a right to] ensure that they are not unwitting participants in this gruesome trade.

Thus the United States cannot consistently argue against attempts by the EU to prevent import of battery eggs, on the grounds that banning of batteries in Europe is a matter of public morality and protection of animal health.

Perhaps some countries will suggest that such attempts by the EU to prevent import of battery eggs are protectionist rather than concerned with

welfare. However, under no possible construction could it be argued that the ban on use of batteries within Europe—with all its fantastical history—is itself motivated by protectionism. One additional piece of evidence against such an interpretation is that any tightening of legislation on housing of laying hens always has been resisted by the industry (cf Jorét 1998). Examples in the United Kingdom and Sweden have been mentioned above, and the horror provoked in egg producers by the 1999 directive has been described. Clearly, egg producers did not regard the legislation as a potential defense against imports from the rest of the world. Nevertheless, not unexpectedly they did ask for protection; indeed, they believe that the Commission and the agriculture ministers have promised it (Farrant 1999). In fact, most reports, from varied sources, recommending tighter legislation on housing of laying hens in Europe have recommended such protection (House of Commons 1981; Scientific Veterinary Committee 1996; Farm Animal Welfare Council 1997; Royal Society for the Prevention of Cruelty to Animals undated [b]). Still this cannot be described as protectionism. Certainly protection of European egg producers is envisaged, but on the two grounds of fairness and animal protection. It would be unfair to require producers to adopt more costly, humane systems and then suffer competition from cheaper, inhumane imports. And this would not protect animals if sales of eggs from cages outside Europe displace egg production from more humane systems in Europe; the common phrase is that “we would be exporting our welfare problems.” Clearly, if the main effect of the directive is a great reduction in European egg production and substitution by battery egg production elsewhere in the world, it will have failed in its intentions. The Scientific Veterinary Committee suggested that “high standards of laying hen welfare can only be implemented and sustained if the EU market is protected against imports of eggs from third

countries with lower standards” (Scientific Veterinary Committee 1996, 111).

If the EU succeeds in restricting import of battery eggs, or in other measures such as being allowed to label eggs from different systems or subsidize farmers required to renounce batteries, the Commission surely will recommend few, if any, changes to the directive. In that case, changes to existing battery cage systems will accelerate in 2010 or so. Indications are that most producers will choose to use enriched cages rather than other alternatives, particularly in the colder northern countries.

However, success for the EU in the WTO negotiations is not assured.

Prospects Under Free Trade

What will the socio-economic implications be if such protection cannot be achieved? Could the directive still be implemented? Yes, it could. The chance of a great reduction in European egg production is small. The suggestion of the Scientific Veterinary Committee (1996), just quoted, probably is an overstatement. So is the following statement by Jorét (1998) in responding for the U.K. egg industry to proposals for the directive: “There is no point in legislating our own industry out of existence only to turn round and import that product from those very same systems, but operated to much lower standards than were in use at home.” The phrase, “legislating our own industry out of existence,” is an exaggeration. For years, as mentioned, Denmark has had more stringent legislation on cages than the rest of Europe. Its egg industry survives, albeit perhaps smaller than it might otherwise have been. If this applies to trade within Europe, it applies even more to the threat of longer-distance imports to European countries from outside Europe, at least with regard to whole eggs (which the industry

calls “shell eggs”). The industry acknowledges this. Mary Ann Sörensen of the Federation of Swedish Egg Farmers considers that the importance of freshness in shell eggs should enable countries to retain this market for local production (Farrant 1999). Similarly, Mike Ring, director general of the International Egg Commission, says that “the EU shell egg market will be largely protected by the freshness needs of that market” (Farrant 1999).

There is a possibility, though, that imports of processed eggs, which make up 25 percent of European egg production, would rise. In fact, as these would be from battery cages, the result would be to continue a trend that already is present. References to people’s willingness to buy non-cage eggs apply mainly to fresh eggs; few people consider where the eggs come from in processed food. If other countries increase exports of processed eggs to Europe, it is likely that European egg production would shrink under the proposed changes, but it would not disappear.

Precisely how the European Commission, Parliament, and Council would act in response to such a likelihood is hard to predict, but it is difficult to believe that they would backtrack completely and rescind the ban on battery cages. Given the manifold circumstances leading to the ban, such a move would be seen as a betrayal and would lead to a huge outcry. It seems more likely that, if anything, compromise proposals would be made, lengthening the phase-out period for batteries, for example, or reducing the space requirements in other systems. One additional argument for Europe “putting its own house in order” in this matter, despite world-wide pressures, is that there is reason to believe that the rest of the world will eventually follow. Canada, Australia, and New Zealand—and McDonalds and other chain restaurants in the United States—already have moved toward matching European space allowances

in battery cages. The egg industry also believes that the European battery ban may in due course lead to a “domino effect” in the United States, Canada, and Australia (Farrant 1999).

If Europe cannot protect its egg producers under WTO rules, there will be considerable discussion and lobbying. One additional complicating factor is the potential accession of up to twelve new countries as EU members; these countries are likely to argue that they need more time for implementation than those with a head start. Nevertheless, it is almost certain that there will be major changes to the housing of many or most laying hens in Europe in 2010 and 2011.

Long-term Prospects

Obviously, longer-term prospects depend on many factors, including the WTO negotiations, but one point needs to be made. It has been emphasized that non-cage systems have two major, alternative welfare problems: cannibalism, and the beak trimming required to prevent it. If strains of birds can be developed that do not show cannibalism, then eventually cages probably will be phased out altogether. Such genetic selection is possible (Muir 1996). However, it is not in the economic interests of the poultry breeders, for two reasons: adding any such criterion would reduce breeders’ ability to breed for other, more profitable characteristics, and success would favor the move from cages to other systems, which the industry sees as unfavorable. Thus one of the most important requirements for long-term improvement of laying hen welfare is legislation requiring such selection against cannibalism. If that legislation is passed, enriched cages will perhaps have been a medium-term development, although certainly one that facilitated further change. However, non-cage systems do have other prob-

lems that remain to be solved, such as parasite infestation and poor working conditions for operatives.

Implications for the United States

What are the lessons from such a labyrinthine history for a single country such as the United States?

1. Don’t expect too much too soon. The First (and so far only) North American Symposium on Poultry Welfare was held in 1995 (in Edmonton, Canada)—compared with the European Symposia that effectively started in 1977—and related changes of attitude still have not gathered pace.

2. Change is possible. One of the most important agents for that change is public opinion. Politicians in every European country and related institution comment that they receive more letters on animal welfare than on any other subject, and that this influences and strengthens them in countering industrial muscle. American politicians make similar comments. Furthermore, it seems that expectations of American citizens are being affected by developments in Europe. Differences between the American political system and that in Europe probably will mean, however, that even more public pressure will be needed to effect similar change in the United States.

3. The United States is a single country, but as a union of semi-autonomous states it has much in common with the EU. Individual European countries were successful acting alone, and these actions finally led to communal action. Similarly, single American states could take the lead, and persuade others to follow, on hen housing as on hog factories.

4. In fact, most of the above history shows that piecemeal change is worthwhile in itself, and finally leads to wholesale change. This obviously applies to labelling. Much of the dis-

cussion about labelling refers to giving consumers a choice. In regard to welfare, choice is not actually what is desired; it is desirable to improve the welfare of all hens, not just a small, labelled proportion of them. Yet the fact that some people buy Free Range eggs—and Freedom Foods demonstrates that a significant proportion will “put their money where their mouth is”—has led the way for more widespread change. Labelling schemes in the United States—such as the Farm Free label of the American Humane Association—could receive much more emphasis, to useful effect.

5. Similarly, the initiative by McDonalds in 2000 to require its egg suppliers to increase their cage size parallels the actions by some European supermarkets and has influenced other commercial companies to make similar moves. It is possible that nongovernmental action to influence market structure is a more promising route than regulation in the United States (Thompson 2001).

6. The EU ban on battery cages is the cumulative result (and even now only a partial result) of activity on many different fronts. Some of these have not even been discussed in this account, such as the pressure on the EU to agree—which it finally did (Commission of the European Communities 1997)—that animals are “sentient beings,” not just products. Any campaign in the United States must be similarly multifaceted, bringing pressure to bear on all relevant groups, including producers, retailers, consumers, legislators, and the media.

Note

Another version of this article is cited as Appleby 2003.

Literature Cited

- Aguirre y Mendes, A. 1999. Portugal—Press campaign and political lobbying. *Agscene* 135: 9.
- Abrahamsson, P., R. Tauson, and M.C. Appleby. 1995. Performance of four hybrids of laying hens in modified and conventional cages. *Acta Agriculturae Scandinavica* 45: 286–296.
- Appleby, M.C. 1983. Nest-site selection by domestic hens. *CEC Farm Animal Welfare Programme Evaluation Report, 1979–1983*: 34–38.
- . 1993. Should cages for laying hens be banned or modified? *Animal Welfare* 2: 67–80.
- . 1998. The Edinburgh Modified Cage: Effects of group size and space allowance on brown laying hens. *Journal of Applied Poultry Research* 7: 152–161.
- . 2003. The European Union ban on conventional laying cages: History and prospects. *Journal of Applied Animal Welfare Science* 6 (2): 103–121.
- Appleby, M.C., G.S. Hogarth, J.A. Anderson, B.O. Hughes, and C.T. Whittemore. 1988. Performance of a deep litter system for egg production. *British Poultry Science* 29: 735–751.
- Appleby, M.C., B.O. Hughes, and H.A. Elson. 1992. *Poultry production systems: Behaviour, management and welfare*. Wallingford, England: CAB International.
- Appleby, M.C., A.W. Walker, C.J. Nicol, A.C. Lindberg, R. Freire, B.O. Hughes, and H.A. Elson. 2002. Development of furnished cages for laying hens. *British Poultry Science* 43.
- Brambell, R. 1965. *Command Paper 2836*. London: Her Majesty's Stationery Office.
- Commission of the European Communities (CEC). 1985. Amendment 1943/85 to Regulation 95/69, also amended by 927/69 and 2502171. *Official Journal of the European Communities* (July 13).
- . 1986. Council Directive 86/113/EEC: Welfare of battery hens. *Official Journal of the European Communities* (L 95) 29: 45–49.
- . 1992. *European Communities draft recommendations No. VI/2327/92*. Brussels: CEC.
- . 1997. *Protocol on the welfare and protection of animals*. Brussels: CEC.
- . 1998. *Proposal for a Council Directive laying down minimum standards for the protection of laying hens kept in various systems of rearing*. Brussels: CEC.
- . 1999a. *Proposal for a Council Directive laying down minimum standards for the protection of laying hens [Amendment from the German Presidency]*. Brussels: CEC.
- . 1999b. Press release. <http://ue.eu.int/newsroom/main.cfm?LANG=1>.
- . 1999c. Council Directive 1999/74/EC laying down minimum standards for the protection of laying hens. *Official Journal of the European Communities* August 3, L 203: 53–57.
- Compassion in World Farming (CIWF). 1999. Europe agrees ban on battery cages: Huge victory for animal welfare. *Agscene* 135: 10.
- Council of Europe. 1976. *Convention on the Protection of Animals Kept for Farming Purposes*. <http://conventions.coe.int/Treaty/EN/Treaties>.
- Council of the European Union. 2003. Qualified majority. <http://ue.eu.int/en/Info>.
- Cruickshank, G. 1999. Egg producers call for unity to fight cage ban. *Poultry World* (August): 1–3.
- Dawkins, M.S., and S. Hardie. 1989. Space needs of laying hens. *British Poultry Science* 30: 413–416.
- Department for Environment, Food and Rural Affairs. 2002. Consultation on a possible ban on the use of enriched cages for laying hens in England. <http://www.defra.gov.uk/corporate/consult/enrichedcages/letter.htm>.
- de Wit, W. 1992. The welfare of laying hens kept under various housing

- systems: Report to the EC. *Proceedings, World's Poultry Congress*, Amsterdam: 320–323.
- Ehlhardt, D.A., and C.L.M. Koolstra. 1984. Multi-tier system for housing laying hens. *Pluimveehouderij* (December 21): 44–47.
- Elson, H.A. 1981. Modified cages for layers. In *Alternatives to intensive husbandry systems*, 47–50. Potters Bar, England: Universities Federation for Animal Welfare.
- . 1985. The economics of poultry welfare. In *Proceedings, Second European Symposium on Poultry Welfare*, ed. R.M. Wegner, 244–253. Celle, Germany: World's Poultry Science Association.
- . 1999. Laying cages to be enriched, not banned. *Poultry World* (August): 16.
- European Communities. 2000. *European Communities proposal: Animal welfare and trade in agriculture*. WTO Committee on Agriculture, Special Session, Paper G/AG/NG/W/19: www.wto.org, Trade Topics, Agriculture, Negotiations.
- Farm Animal Welfare Council (FAWC). 1986. *An assessment of egg production systems*. Tolworth, England: FAWC.
- . 1991. *Report on the welfare of laying hens in colony systems*. Tolworth, England: FAWC.
- . 1997. *Report on the welfare of laying hens*. Tolworth, England: FAWC.
- Farrant, J. 1999. IEC's world action to keep cages. *Poultry World* (November): 1–4.
- Fredell, R. 1994. Welcoming remarks. In *Future egg production in Sweden: Prospects for alternatives to conventional cage keeping of laying hens in a larger scale in Sweden*, ed. M.A. Sörensen, 1. Kunsängen, Sweden: Kronägg.
- Fröhlich, E.K.F., and H. Oester. 2001. From battery cages to aviaries: 20 years of Swiss experience. In *Proceedings, 6th European Symposium on Poultry Welfare*, ed. H. Oester and C. Wyss, 51–59, Zollikofen, Switzerland: World's Poultry Science Association.
- Gibson, S.W., P. Dun, and B.O. Hughes. 1988. The performance and behaviour of laying fowls in a covered strawyard system. *Research and Development in Agriculture* 5: 153–163.
- Harrison, R. 1964. *Animal machines*. London: Stuart.
- House of Commons. 1981. *First report from the Agriculture Committee, Session 1980–81: Animal welfare in poultry, pig and veal calf production*. London: Her Majesty's Stationery Office.
- Jorêt, A.D. 1998. Walking the animal welfare tight-rope—An egg industry view. In *Farm animal welfare: Who writes the rules? Programme & summaries*, ed. British Society for Animal Science, 2. Edinburgh: British Society for Animal Science.
- Keeling, L.J., B.O. Hughes, and P. Dun. 1988. Performance of free range laying hens in a Polythene house and their behaviour on range. *Farm Buildings Progress* 94: 21–28.
- Ludvigsen, J.B., J. Empel, F. Kovacs, M. Manfredini, J. Unshelm, and M. Viso. 1982. Animal health and welfare. *Livestock production science* 9: 65–87.
- Ministry of Agriculture, Fisheries and Food (MAFF). 1969. *Codes of recommendations for the welfare of livestock: Domestic fowls*. London: MAFF Publications Office.
- . 1987. *Codes of recommendations for the welfare of livestock: Domestic fowls*. London: MAFF Publications Office.
- Matter, F., and H. Oester. 1989. Hygiene and welfare implications of alternative husbandry systems for laying hens. In *Proceedings, Third European Symposium on Poultry Welfare*, ed. J.M. Faure, and A.D. Mills, 201–212. Tours, France: World's Poultry Science Association.
- Muir, W.M. 1996. Group selection for adaptation to multi-hen cages: Selection program and direct responses. *Poultry Science* 75: 447–458.
- Nørgaard-Nielsen, G. 1986. *Behaviour, health and production of egg-laying hens in the Hans Kier system compared to hens on litter and in battery cages*. Rapport til Hans Kier Fond, Forseningen tel Dyrenes Beskyttelse Danmark, 1–198.
- Royal Society for Prevention of Cruelty to Animals (RSPCA). Undated (a). *Home to roost: The future for laying hens*. Horsham, England: RSPCA.
- . Undated (b). *Conflict or concord? Animal welfare and the World Trade Organisation*. Horsham, England: RSPCA.
- Sansolini, A. 1999a. Europe in brief. *Agscene* 134: 13.
- . 1999b. Italian turning point. *Agscene* 135: 7.
- Scientific Veterinary Committee (Animal Welfare Section). 1996. *Report on the welfare of laying hens*. Commission of the European Communities Directorate-General for Agriculture VI/B/II.2.
- Sörensen, M.A. 1994. Economical and political considerations of keeping laying hens in Europe and in the EU: The Swedish case. In *Future egg production in Sweden: Prospects for alternatives to conventional cage keeping of laying hens in a larger scale in Sweden*, ed. M.A. Sörensen, 85–96. Kunsängen, Sweden: Kronägg.
- Stevenson, P. 2001a. An ethical approach to farm animal husbandry. In *Proceedings, Ethics and Animal Welfare 2001: Relationships between Humans and Animals*. Conference, Stockholm, May. (Comment cited is not in the printed abstract.)
- . 2001b. *The WTO rules: Their adverse impact on animal welfare*. Petersfield, England: Compassion in World Farming Trust.
- Tauson, R. 1985. Mortality in laying hens caused by differences in cage design. *Acta Agriculturae Scandinavica* 35: 165–174.
- . 1986. Avoiding excessive

- growth of claws in caged laying hens. *Acta Agriculturae Scandinavica* 36: 95–106.
- . 1988. Effects of redesign. In *Cages for the future*, Cambridge Poultry Conference, 42–69. Nottingham, England: Agricultural Development and Advisory Service.
- . 2000. Furnished cages and aviaries: Production and health. *Proceedings, 21st World Poultry Congress, Montreal*: 8–17.
- Tauson, R., and K.E. Holm. 2001. First furnished small group cages for laying hens in evaluation program on commercial farms in Sweden. In *Proceedings, 6th European Symposium on Poultry Welfare*, ed. H. Oester, and C. Wyss. 26–32. Zollikofen, Switzerland: World's Poultry Science Association.
- Thompson, P.B. 2001. Book review: What should we do about animal welfare? *Applied Animal Behaviour Science* 73: 81–82.
- U.S. Congress. 2000. Dog and Cat Protection Act. *U.S. Congress Proceedings PL 106/476* Chapter 3: sections 1441–1443.
- Wegner, R.M. 1990. Experience with the get-away cage system. *World's Poultry Science Journal* 46: 41–47.