THE IMPACTS OF THE NEW EU DIRECTIVE FOR LAYING HEN HUSBANDRY ON THE PRODUCTION AND TRADE PATTERNS FOR EGGS AND EGG PRODUCTS IN THE EU

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INTRODUCTION

In June 1999 the Secretaries of Agriculture of the European Union (EU) passed a new directive for laying hen husbandry which will have far reaching impacts on the future sectoral and regional pattern of egg production in the EU itself but also in other parts of Europe, adjacent production regions, and the United States. EU member states play an important role in global egg trade. In 2002 about 56 % of all exported shell eggs for consumption had their origin in the EU and 59 % of all imported eggs were destined for an EU member state. Up to the present date about 89 % off all layers in the EU are kept in cages. The new directive prohibits the conventional layer cage from January 1st, 2012 on in all EU member states and the installation of such cages from January 1st, 2003.

If during the next round of the WTO negotiations no regulations can be found that prohibit the import of eggs and egg products into the EU from countries in which conventional layer cages are still permitted, the egg producing sector in the EU will no longer be competitive. What impacts this may have on the spatial pattern of egg production, egg trade and the poultry equipment supply industry will be discussed in this paper.

In October 2001 the German *Bundesrat* passed a directive for laying hen husbandry which states that from January 1st, 2007 on conventional cages will be prohibited and from January 1st, 2012 on also enriched cages. This directive became effective in Germany on March 13th, 2002. It will have far reaching impacts on the German egg and egg products industries and also on the global trade patterns of eggs and egg products as Germany is already now the leading importer of shell eggs. In 2002 more than 28 % of all shell eggs that were traded worldwide, were imported by this country. So it is not surprising that the egg producers in Germany started an initiative to alter the directive and to inform policy makers, consumers, and animal welfare organisations about the possible consequences of the directive. In November 2003 the German *Bundesrat* again discussed the directive. A majority of the state representatives voted for a modification. They suggested that all laying hen husbandry forms should be tested under animal welfare aspects, the permission to use conventional cages should be extended for two more years and that available husbandry systems for laying hens should be permitted for continuous use only after having been tested by an independent institution. The Secretary of Consumer Protection, Nutrition and Agriculture, Renate Kuenast, announced that she would not sign this decision because of its incompatability with a decision of the German Supreme Court (*Bundesverfassungsgericht*) which had decided that the old German directive for laying hen husbandry did not meet the standards of animal welfare and had demanded that a new directive would have to include several minimal standards with respect to trough length, the ability to move and rest etc.

However, after the publication of two empirical studies which compared laying hen husbandry in enriched cages and alternative husbandry systems (Kreienbrock 2004, FAL 2004), things began to change. The studies could show that enriched cages with much more space for the birds (750 cm^2), larger groups (up to 60 birds), perches, scratching areas etc. showed excellent results with respect to the health of the laying hens, mortality rates, laying rate, feed conversion in comparison with floor management and free range systems. On March 26th, 2004 the secretaries of agriculture of the German states discussed these results with the secretary of consumer protection, nutrition and agriculture. They unanimously agreed that *small aviaries* should be permitted in Germany. They also decided that regulations for the independent testing of laying hen husbandry forms should be passed by the end of 2004 so that based on the results of such a test the permission for the permanent use of the tested and approved systems will be granted. For the first time, the Secretary of Consumer Protection, Nutrition and Agriculture declared in a press conference that she supported a competitive egg production in Germany. Nevertheless, the decision of the *Bundesrat* of October 2001 is still effective.

In this paper the frame for further discussion of these topics will be set.

1. THE SETTING: REGIONAL PATTERNS OF EGG PRODUCTION AND EGG TRADE

The first step of this analysis will provide an overview of the regional patterns of egg production and egg trade in order to identify the major production centres and trade relations.

Global egg production rose from 35.2 to almost 56 million tonnes or by 59 % between 1990 and 2003 (table 1). A closer look at this development reveals marked regional differences. Whereas Europe had to face a decline in production by more than 1.2 million tonnes, production rose by 18.4 million tonnes in Asia, followed by North and Central America with 2.2 million tonnes and South America with 720,000 tonnes.

Table 1:
The development of global egg production between 1990 and 2003, data in 1,000 t
(Source: FAO-Database)

Region	1990	1995	2003	Change (%)
Africa	1,550	1,770	2,082	+ 34.3
N. a. C. America	5,698	6,411	7,951	+ 39.5
South America	2,233	2,641	2,951	+ 32.1
Asia	14,507	22,492	32,927	+ 127.0
Europe	11,125	9,514	9,886	- 11.1
Oceania	244	208	195	- 20.1
World	35,208	43,036	55,992	+ 59.0

These data are, however, too generalised to inform about changes in the centres of egg production. Therefore, in table 2, the ten leading egg producing countries in 1990 and 2003 are compared with respect of their ranking and the development of production.

Table 2 shows that in 2003 the ten leading countries accounted for 72.0 % of the global egg production, a massive increase from 1990 when they contributed only 55.8 %. This is mainly due to the enormous increase in China (+ 240.9) but also the United States, India, Mexico, and Brazil recorded impressive gains. On the other hand, egg production in Germany decreased by 10.7 %, and Ukraine is no longer in the top ranks. The regional concentration of egg production is very high. In 2003, the three leading countries alone contributed 53.6 % to the global egg production.

Table 2:
The ten leading countries in egg production in 1990 and 2003 data in 1,000 t
(Source: FAO-Database)

1990		2003	
Country	**Production**	**Country**	**Production**
China	6,559	China	22,362
USA	3,965	USA	5,141
Russia	2,641	Japan	2,500
Japan	2,419	India	2,200
India	1,282	Russia	2,040
Brazil	1,230	Mexico	1,925
Mexico	1,010	Brazil	1,580
Germany	985	France	1,000
Ukraine	944	Germany	880
France	887	United Kingdom	704
Total	20,692	Total	40,332
Share of world production (%)	55.8	Share of world production (%)	72.0

Total egg production in the EU has not changed very much between 1990 and 2003 as can be seen from table 3. The contribution of single countries to the overall production has changed considerably, however.

Table 3 shows that Germany and Sweden had to face the highest absolute decrease, the highest relative decrease Finland, Sweden, and Germany. In contrast to this, Portugal, Belgium, and France showed the highest relative increase, this changed the pattern of egg trade in the EU as will be shown later.

Table 3:
The development of egg production in the EU between 1990 and 2003, data in 1,000 t
(Source: FAO-Database)

Country	1990	1995	2003	Change (%)
France	886.8	1,024,6	1,000.0	+ 12.8
Germany	985.0	836.0	880.0	- 10.7
United Kingdom	622.3	625.2	704.2	+ 3.2
Spain	666.6	694.0	700.0	+ 5.0
Italy	655.9	721.0	698.7	+ 6.5
The Netherlands	648.0	602.0	653.0	+ 0.8
Belgium/Lux.	159.2	219.9	180.0	+ 13.1
Greece	116.0	116.3	110.0	- 5.2
Portugal	79.6	102.8	108.5	+ 36.3
Sweden	129.8	105.0	93.9	- 27.7
Austria	95.7	103.1	90.0	- 6.0
Denmark	82.4	94.8	81.6	- 1.0
Finland	76.4	74.7	53.0	- 30.6
Ireland	31.1	30.8	34.0	+ 9.3
EU (15)	5,234.8	5,350.6	5,386.9	+ 2.9
% of world egg production	14.9	12.4	9.8	-

Table 4:
World trade with shell eggs in 2002
(Source: FAO-Database)

Region	Exports		Imports	
	1.000 t	Share (%)	1.000 t	Share (%)
Africa	19.4	1.9	36.5	4.0
N. a. C. America	71.3	7.1	64.5	7.1
South America	14.6	1.5	6.2	0.7
Asia	260.3	25.9	202.5	22.4
Europe	639.2	63.5	595.0	65.7
Oceania	1.0	0.1	0.9	0.1
World	1,005.8	100.0	905.6	100.0

A closer look at the pattern of egg trade reveals that about 1 mill. t of shell eggs were exported in 2002, liquid eggs and egg products are excluded (table 4). In these figures, trade among EU member states are included. Europe and Asia hold a leading position in exports as well as in imports, followed by North and Central America.

As can be seen from table 5, several member states of the EU ranked among the leading export and import countries for shell eggs for consumption in 2002. The Netherlands were by far the most important export country, contributing 26.3 % of all exports, followed by Malaysia, Belgium, China, and Germany. If, however, the intra-EU trade would be omitted, Malaysia would be in a leading position. Malaysia and China are playing a considerable role on the egg market in East Asia, Iran in the Near East, which will have impacts on the exports of the Netherlands, as they are supplying the same countries. Germany has been the leading egg importing country for several years, with a market share of 28.5 % in 2002. The rate of self-sufficiency has been decreasing for years, in 2002 it was as low as 74 %. A per capita consumption of 217 eggs and a population of about 82 mill. people, made Germany the most attractive shell egg market in the world, as more than 4.0 billion eggs had to be imported annually in the 1990s. So it is not surprising that the adjacent countries tried to reach a high market share, not only for shell eggs but also for egg products. Changes in production cost as a consequence of new legal regulations in this country will therefore have far reaching impacts on egg production and egg trade, not only in the EU but world-wide.

Table 5:
The ten leading export and import countries for shell eggs in 2002, data in 1,000 t
(Source: FAO-Database)

Country	Export	Country	Import
Netherlands	264.6	Germany	257.8
Malaysia	115.2	China	82.0
Belgium	86.2	Italy	62,8
China	83.9	The Netherlands	61.4
Germany	68.5	United Kingdom	45.7
Spain	61.1	Canada	34.2
USA	60.9	Belgium	32.4
France	43,3	Singapore	26.5
Belarus	30.8	Switzerland	25.5
Iran	18.6	Austria	14.7
Total	833.1	Total	643.0
Share of world exports (%)	82.8	Share of world imports (%)	71.0

In order to better understand the statements in chapter 3, which will deal with possible impacts of the new EU directive and the new directive for laying hen husbandry in Germany, the export and import relations between Germany and the Netherlands will be studied in more detail.

Table 6 shows that Germany has been importing between 4.0 and 4.4 bill. eggs per year since the early 1990s. Whereas the Netherlands could more or less maintain their market position until 2000, then the impacts of the Avian Influenza outbreak and a new paradigm in agricultural policy which will deglomerate areas of intensive agricultural production, led to a massive reduction of the export volume. Belgium has lost market shares since the mid-1990s. In 2002, the Netherlands still contributed 85.7 % to Germany´s egg imports according to official German data, in 2003 only 69.4 %. Because of the dioxin crisis, imports from Belgium decreased by almost 90 % between 1996 and 2001, but recovered in 2003. Non-EU countries were of minor importance until 2002 as suppliers for the German egg market, then Poland became more important with an export volume of 141 mill. eggs. This trade pattern will further change, however, within the next years, definitely after 2007.

Table 6:
The development of Germany´s shell egg imports between 1992 and 2003, data in mill. pieces
(Source: ZMP Bilanz: Eier und Geflügel, various editions)

Exporting country	1992	1996	2000	2003
Netherlands	3,936.3	2,974.3	3,922.6	2,782.3
Spain	21.9	9.2	27.4	354.6
France	79.9	252.0	216.3	210.7
Belgium/Lux.	279.9	822.6	94.8	209.2
Italy	0.0	0.0	1.5	100.4
United Kingdom	1.1	6.6	11.8	7.9
Finland	16.3	10.8	2.7	0.0
EU total	4,366.5	4,158.5	4,323.4	3,780,6
Non EU countries	65.8	26.7	36.4	225.8
Total	4,432.3	4,185.2	4,359.8	4,006.3

From table 7 one can see that according to official Dutch data the exports to Germany in 2003 were a bit lower. This would mean that almost 77 % of all exports had Germany as their destiny. From a detailed data analysis it would become obvious that until 2002 the Dutch exporters tried to compensate their losses on the EU market by increasing the exports to non-EU countries. This is no longer true for 2003, as exports to these countries decreased by 60 %, total exports by almost one third. The industry has not yet recovered from the Avian Influenza outbreak.

Table 7:
The development of Dutch shell egg exports between 1992 and 2003, data in mill. pieces
(Source: ZMP Bilanz: Eier und Geflügel, various editions)

Importing Country	1992	1996	2000	2003
Germany	3,830.5	3,761.3	3,446.9	2,544.0
Belgium/Lux.	784.5	424.1	182.1	171.3
United Kingdom	171.6	204.1	234.9	123.8
EU Total	5,216.3	4,805.9	4,576.1	2,986.0
Switzerland	198.1	138.6	102.1	58.8
Unit. Arab. Emirates	123.1	39.9	210.5	2.7
Non-EU Countries Total	876.6	548.6	788.4	322.4
Total	6,092.9	5,354.5	5,364.5	3,308.3

2. THE NEW EU AND GERMAN DIRECTIVES FOR LAYING HEN HUSBANDRY

The invention of the layer cage and the combination with automatic water and feed supply systems as well as automatic egg collecting and sorting systems initiated a revolutionary change in egg production. The result was a safe and cheap animal product. When in the late 1960s and early 1970s such systems showed up in Europe and North America, a sectoral and regional concentration process began. On the one hand, egg production shifted from small farm flocks to vertically integrated agribusiness companies which combined parent stocks, hatcheries, feed mills, layer farms, and sometimes even egg products plants under one roof. On the other hand, such companies very often concentrated in favourable locations, so that these regions gained high market shares. Hybrid hens with laying rates that had not been thought possible before World War II, the improvement of the health status of the animals, and constantly increasing feed conversion rates mark the success story of industrialised egg production. Economic success, however, was only one aspect, the question if such a production system would also meet the regulations of animal protection laws was another. When vertically integrated companies originated and average flocks sizes increased, animal welfare groups started their crusade against this form of animal production, sometimes peaceful, sometimes militant. This is not the place to go into more detail, but one must not forget that the decision of the Secretaries of Agriculture of the EU member states does not only have an animal welfare but also a political aspect. A perhaps unexpected result was the fact that 13 of the 15 member states agreed to the new directive, only Spain abstained from voting and Austria voted against it as not being strict enough.

What are the regulations in *Directive 1999/74/EC (July 19th 1999)* and when will they become effective?

The directive distinguishes between regulations for alternative systems of laying hen husbandry, conventional cages and furnished or enriched cages. The main statements for conventional and furnished cages are:

Conventional cages:

- From January 1st, 2003 on for each hen a space of 550 cm^2 has to be supplied, also a trough length of 10 cm per animal. For 65 % of the cage base the height has to be at least 40 cm, no part of the cage may be lower than 35 cm.
- Conventional cages are not permitted after January 1st, 2012, from January 1st, 2003 on conventional cages may no longer be installed in layer farms.

Furnished or enriched cages:

- From January 1st, 2003 on for each hen a space of 750 cm^2 has to be supplied in cages of this type, of which 600 cm^2 have to be usable space. The base of a cage must not be smaller than 2,000 cm^2, outside the usable space the height of the cage has to be at least 20 cm.
- Cages have to be furnished with a nest, perches that offer at least 15 cm resting space for each hen, and a sand-bath (scratching area). For each hen a trough length of at least 12 cm has to be available.

How does the German directive differ from that of the EU?

On July 6th, 1999 the German Supreme Court passed a verdict that answered the question if the directive for laying hen husbandry (*Hennenhaltungsverordnung*, dated December 12th, 1987) was compatible with the Constitution (*Grundgesetz*) and the Animal Protection Law (*Tierschutzgesetz*, dated August 18th, 1986). This question had been asked by the State Government of Northrhine-Westphalia. The Supreme Court decided that:

- the directive for laying hen husbandry is not compatible with the Constitution and has to be modified by the federal government;
- layer farms can therefore no longer be permitted according to the directive of laying hen husbandry from 1986;
- a space of 450 cm^2 per hen and a trough length of 10 cm are not sufficient to allow an undisturbed resting and simultaneous feeding of the animals.

It is important to realise that the verdict of the Supreme Court demanded an immediate reaction of the federal government of Germany. After very controversial negotiations, the German *Bundesrat* passed the new directive for laying hen husbandry in October 2002 with a majority of only one vote, to the great surprise of the egg industry and perhaps even the Secretary of Consumer Protection, Nutrition, and Agriculture. The main regulations of the new directive are:

- From January 1st, 2003 on no cages may be installed, neither conventional nor enriched ones.
- From January 1st, 2007 on conventional cages and from January 1st, 2012 on enriched cages will be prohibited in Germany.
- From January 1st, 2003 on laying hens may only be kept in new facilities that are at least 2 m high and have a basic area of at least 2 m x 1.5 m.
- A single flock must not be larger that 6,000 hens.

The EU commission certified the new directive for laying hen husbandry in early March and it became effective on March 13th, 2002. From that date on it is prohibited to install any type of cage in a German egg farm. It can easily be seen that this new directive which is still effective, in spite of the decisions of the *Bundesrat* of November 2003 and March 2004, will have far reaching impacts on the German egg and egg products industries.

3. IMPACTS ON EGG PRODUCTION

Which impacts will the new EU and German directives for laying hen husbandry have on egg production in the EU and in Germany? At the present time it is almost impossible to give a reliable answer to this question as the transformation process is still in its initial phase. So only first results can be given, based on interviews with leading persons from poultry equipment suppliers, agribusiness companies, poultry associations, and scientific publications as well as own calculations.

What will be the impacts of the EU directive? From January 1st, 2003 on the guideline demands at least 550 cm^2 of space per hen. This means that one hen less can be kept in a standard cage, i.e. 4 instead of 5.

According to a study by Wolffram et. al. (2002) the following impacts of the EU-directive can be expected:

- Egg production in the EU will decrease by about 11 billion pieces.
- The rate of self-sufficiency will decrease from 103 % in 1999 to 96 % in 2012. This does not include the impacts of the new German directive for laying hen husbandry.
- The EU will become a net importer of shell eggs.
- About 5 to 6 billion € will be necessary until 2012 to fulfil the regulations of the directive.
- About 12.300 jobs will be lost.

The economic impacts of the new EU directive will be far reaching. Most of the egg producers in the EU are afraid that it will not be possible to reach a result during the next WTO-negotiations which prohibits the import of shell eggs and egg products from countries that still allow conventional cages. This would mean that the production cost within the EU would be much higher than in non-EU countries.

What will be the impacts of the German directive for laying hen husbandry?

Three scenarios for the possible development of egg production and egg trade in Germany will be presented. These scenarios are based on a study of this author (Windhorst 2004a).

The basis for the three scenarios is the year 2002. The structure of egg production and trade can be characterised in the following way:

- 40.8 mill. laying hens were kept in farms with 3,000 and more places for hens.
- 83.9 % of the hens were kept in conventional cages, the average laying rate was 285 eggs/hen and year.
- 8.6 % were kept in free-range systems, here the average laying rate was 250 eggs/hen and year,
- 6.6 % were kept in floor management systems with a laying rate of 260 eggs/hen and year,
- and 0.8 % in other systems with a laying rate of 240 eggs/hen and year.

Farms of this size produced 11.4 bill. eggs, this was a share of 86.4 % of the total egg production in Germany. About 4.1 billion eggs for human consumption had to be imported to cover the domestic demand.

Scenario 1: EU directive (1999/74/EC) becomes effective

On January 1st, 2003, the first step of the EU directive (1999/74/EC) became effective. For each hen a space of 550 cm^2 had to be supplied also a trough length of 10 cm. What were the impacts of this directive? Most of the installed conventional cages in Germany had a usable space of 2,300 cm^2 which made it possible to have 5 birds per cage. As the new directive demands 550 cm^2 one hen had to be removed from each cage. This resulted in:

- a reduction of the laying hen flock in farms with 3,000 and more places from 40.8 mill. laying hens to 35.7 mill. hens or by 13 %,
- a reduction of egg production from 11.4 bill. to 9.9 bill. eggs,
- a decrease in the value of primary egg production of 200 mill. € and of 100 mill. € in associated industries, such as feed mills or the egg products industry,
- a loss of 666 jobs,
- additional imports of 1.5 bill. eggs (total: 5.6 bill.),
- about 120 mill. € would have been needed to build new layer farms and to keep the production volume on the level of 2002. This, however, is a fictitious value as enriched cages are not

permitted and the market for eggs from alternative husbandry systems is more or less saturated.

Scenario 2: Banning of conventional cages from 2007 on

From January 1st, 2007 on conventional cages are no longer permitted in Germany according to the still effective directive of October 2001. As enriched cages are also not permitted, all eggs have to be produced in alternative husbandry systems. In the following scenario it is assumed that all farms with conventional cages will remain in production and either be transformed into floor management or free-range systems. The situation of the egg industry in Germany in 2007 can be characterised as follows:

- The number of laying hens in farms with 3,000 and more places will decrease from 35.7 mill. to 19.6 mill. or by 45.1 %. If the flocks of 2002 are taken as the basic value, by 52 %.
- Egg production will drop from 9.9 bill. to 5.0 bill. pieces or by 44.5 %.
- The value of primary egg production will decrease by another 500 mill. €, that of the associated industries by 400 mill. €.
- Egg farms and associated industries will lose at least 3,200 jobs.
- In order to supply the German market with shell eggs and to maintain a self-sufficiency rate of 74 %, another 4.9 bill. eggs have to be imported (total imports: 10.5 bill. eggs),
- As cages cannot be used any longer and the farms have to be transformed to alternative husbandry systems, about 950 mill. € will be necessary to switch to these systems.

Quite obviously, policy makers did not consider which problems would result from the banning of cages, especially in eastern Germany. Here, a large number of egg producers invested large amounts of money to build either new farms with state-of-the-art technology or installed new equipment in existing farm buildings. The federal and state governments supported their decision as necessary steps to be competitive in a globalising market. Now these egg farmers are forced to use their cages as long as possible because of the loans they received from the banks. The banks will not give the permission to install alternative husbandry systems before December 31st, 2006 and are not willing to give new loans to the farmers as many of them have not been able to pay off the old loans. The same is true for a considerable number of egg farms in western Germany. The consequence is that the transformation process will hardly begin before 2007 and then last for several years, as the companies which develop and produce the equipment will not be willing to pre-fabricate alternative husbandry systems for about 20 mill. laying hens, because they do not know how many of the farms will be transformed, how many egg farmers will quit egg production and how many large egg producers plan to build new facilities with enriched cages in Eastern Europe. The result will be that either the self-sufficiency rate will drop far below 35 % or the federal government will have to permit the use of conventional cages for several more years during the transformation period to alternative husbandry systems (c. f. Windhorst 2004a). One can only be astonished about the naivety with which policy makers passed such a directive.

Scenario 3: Enriched cages will be permitted in Germany

What will be the situation if the directive of October 2001 will be altered because of new insights in the disadvantages of alternative husbandry systems with respect to higher mortality, disease problems, the increasing risk for the introduction and dissemination of highly infectious diseases, egg quality, and environmental problems resulting from ammonia emission and the contamination of the soil and groundwater in free-range systems (c. f. Jacobs and Windhorst 2003, FAL 2004, Kreienbrock et al. 2004). If enriched cages or *small aviaries* will be permitted from 2012 on as in other EU member states, the situation of egg production and egg trade will be like this:

- The number of laying hens in farms with 3,000 and more places will decrease from 35.7 mill. to 28.9 mill. birds or by 19 %.
- Egg production will drop from 9.9 bill. to 7.9 bill. pieces or by almost 21 %.
- The value of primary egg production will decrease by another 200 mill. € compared to 2003, that of the associated industries also by another 200 mill. €.
- About 1,700 jobs will be lost on egg farms and in the associated industries.
- Another 1.9 bill. eggs (total imports: 7.5 bill. eggs) will have to be imported to meet the demand on the domestic market.
- About 820 mill. € will have to be invested to install enriched cages in farms which formerly used conventional cages.

This scenario shows that despite the permission of enriched cages Germany will have to import 3.5 bill. eggs more than in 2002 to meet the demand on the domestic market. As from 2012 on the EU will also be a net importing region for shell eggs if egg producers do not invest large amounts of money in new egg farms, there will be a shortage of eggs.

The willingness to invest in new egg farms will to a high degree depend on the development of production costs for eggs in the EU and non-EU countries. A study by van Horne and Bondt (2003) could show that the increase of production costs for eggs as a result of the EU directive (1999/74/EC) will result in the competitiveness of Polish producers on the German market. A further reduction of the import tariffs by 36 % and an increase of the exchange rate of the € by about 15 % will result in the competitiveness for producers from Ukraine and India on the German market. So these countries may become suppliers for the German consumers. What this does mean for

animal welfare, environmental protection, egg quality, and food safety will not be discussed here but should be considered by policy makers and the Secretary of Consumer Protection, Nutrition and Agriculture. It is one side of the medal to announce a shift in the paradigm of agricultural policy and another to deal with the consequences of such a shift.

It has to be assumed that the increase of production costs resulting from the banning of conventional cages in the EU and all cages in Germany will lead to higher egg costs for the egg products industry. If the industry will be able to adjust to this new situation is a still open question.

A very critical economic situation is also expected on the side of the poultry equipment suppliers. The EU guidelines and the decision of the German *Bundesrat* have led to an almost complete standstill in further investments in egg production in many of the EU member states. This phase could easily last until 2005, when the EU will finally decide about the equipment of enriched cages. Even though several prototypes of such cages are available, investors are very careful with their decisions as they cannot foresee the results of the WTO negotiations. According to our own investigations, poultry equipment suppliers could sell less than 1 mill. places for laying hens in enriched cages in EU member states until the end of 2003. This is about 0.4 % of the present hen population in cages. Especially in some of the future member states of the EU, cages that can be transformed to enriched cages were installed in 2003, exact numbers are, however, not available. It can be expected that some of the large German egg producing companies will build new facilities in Poland, Hungary, and other countries of Eastern Europe if the German directive will not be changed. This will lead to a further decrease of the German self-sufficiency rate.

4. DISCUSSION: FURTHER CHALLENGES FOR THE EGG AND EGG PRODUCTS INDUSTRIES

In addition to the changed legal framework, further challenges are at hand for the egg and egg products industries in Europe. They can be summarised as follows:

- The globalisation of the markets for agricultural products will offer new chances for non EU member states.
- Product safety and quality assurance will become the leading driving forces in the future development of markets for agricultural, especially animal products, and demand the implementation of supply chains.
- Aspects of animal welfare and environmental protection will become more important in future and ask for reactions.
- Biotechnology and gene-technology will open new ways in food design.

What impacts will this have on the egg and egg products industries? A first statement is that the egg as well as the egg products industries will be able to operate from a good position because most of the leading egg producing companies have already installed supply chains and can guarantee a high product quality and product safety. The most recent development in the EU with respect to keeping laying hens in cages or battery systems shows, however, that aspects of animal welfare will gain in importance and that the industry will have to adjust. In addition to that, environmental aspects as well as the permanent risk of the introduction and dissemination of highly infectious diseases in the centres of egg production in some EU member states will become more important during the next years and ask for reactions. The outbreaks of Avian Influenza in Italy and the Netherlands showed how far reaching the economic impacts can be.

A second statement is that in future only companies or production regions that are able to supply the market with high quality products and can prove that during the whole production process animal welfare and environmental protection have been cared for and legal regulations have been met, will be successful in the market. Those companies and regions that cannot meet these challenges will be the losers. Producers in non-EU countries that plan to export into the EU should adjust to these standards if they want to be successful in this attractive market in the long run.

5. CONCLUSIONS

It has become obvious from the preceding chapters that the Secretaries of Agriculture of the EU member states want to go a way of their own with respect to future systems in laying hen husbandry. Even if one takes into consideration that the aspects product safety, quality assurance, and animal welfare will gain in importance, at least in post-industrial societies, and that from this point of view the decision of the Secretaries of Agriculture and especially the German Secretary of Consumer Protection, Nutrition, and Agriculture will be met with sympathy in the broad public, one must not forget another fact. When asking the average buyer about her/his attitude towards keeping layers in cages, an overwhelming majority says that they dislike it, but nevertheless between 80 % and 90 % of the eggs bought in the EU stem from such farms. Quite obviously, the first attitude does not match with the buying behaviour. Could it be that without legal regulations and directives there would still be conventional cages in future because the consumer would decide this by his shopping behaviour? Another aspect that has not been discussed sufficiently is the aspect of product safety. Very often the average consumer concludes from his dislike of layer cages that shell egg produced in such systems are an unsafe product. The opposite is the case, as could easily be demonstrated (c.f. Jacobs and Windhorst 2003). Quite obviously, the industry has not been able so far to transmit this message. It will not be an easy task to convince the consumer once the new directive for laying hen husbandry will have become effective in Germany. Nevertheless the industry should try to go this way even if it will take a considerable amount of money and some hard years. A third aspect is the increasing risk of the introduction and dissemination of highly infectious diseases that will necessarily be a consequence of the increasing egg imports into the EU and

of the growing number of laying hens in free-range systems.

Because of the development during the last decade and the low growth rates it can be expected that organic eggs will remain a niche product for several more years in spite of the ongoing discussion about product quality, product safety, and animal welfare and supporting government programmes in some EU member states (Windhorst 2004b). The dissonance between the buying behaviour of the consumers and their statements as citizens about the food they prefer and plan to buy is quite obvious. In 2000, organic eggs contributed only 1.2 % to the total production volume of shell eggs in the EU, the same share was reached in human consumption of eggs.

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