

THE EU EGG PRODUCTION SECTOR

Final Report for

Euro Group

Submitted by

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Contents

1. INTRODUCTION	1
2. THE EU EGG PRODUCT MARKET	3
2.1. THE EGG SECTOR	3
2.2. THE EGG PROCESSING SECTOR.....	5
2.3. EU EGG PROCESSING COMPANIES.....	7
2.4. THE MAIN EGG PRODUCTS.....	9
3. EGG AND EGG PRODUCT PURCHASING CRITERIA.....	19
3.1. EGG PURCHASING CRITERIA	19
3.2. EGG PRODUCT PURCHASING CRITERIA.....	19
4. USE OF EGGS IN PROCESSED FOOD AND PRODUCTS.....	21
4.1. MAIN PRODUCTS USING PROCESSED EGGS.....	21
5. USE OF EGGS FROM NON-CAGED BIRDS	23
5.1. MARKET FOR NON-CAGED EGG PRODUCTS	23
5.2. PRICE ISSUES	24
5.3. IDENTITY PRESERVATION	25
5.4. QUALITY ISSUES	25
5.5. MARKETING ISSUES	25
6. TRADE IN EGG PRODUCTS.....	27
6.1. IMPORT DUTIES	27
6.2. TARIFF RATE QUOTAS	28
6.3. TRADE IN EGG PRODUCTS.....	29
6.4. INWARD PROCESSING RELIEF.....	31
6.5. TRADE OUTLOOK.....	32
7. CONCLUSIONS	35

I. Introduction

EuroGroup for Animals wishes to gain a better understanding of the current and future market for egg products within the EU-27 in order to feed into EU policy discussions on the ban on battery cages (Directive 1999/74); in some Member States there is discussion on also banning egg production in enriched cage systems. EuroGroup was particularly interested in the significance of the egg product market in terms of total egg usage and the importance attached to egg products within final products. Agra CEAS Consulting were contracted to provide this research and this document forms our report.

The term "egg products" refers to eggs that have been removed from their shells for processing¹. This processing includes breaking eggs, filtering, mixing, stabilising, blending, pasteurising and cooling. Depending on the type of product it can also include freezing or drying and packaging. Egg products include whole eggs, whites, yolks and various blends with or without non-egg ingredients that are processed and pasteurised. These are then sold in liquid, frozen, and dried forms. Egg products are then either used in the catering sector or are used in the production of food products such as mayonnaise, ready meals, sauces and ice cream.

The research was carried out between January and April 2008 by means of personal interviews with key players in the egg product industry and amongst food manufacturers and through desk research and data analysis. The intention had been to speak to two food manufacturers. In practice, of the five initially contacted only one was willing to speak to us on this subject. A major food retailer was approached and interviewed as an alternative.

¹ Egg products are defined in Regulation (EC) No. 853/2004 as referring to "processed products resulting from the processing of eggs, or of various components or mixtures of eggs, or from the further processing of such processed products."

2. The EU egg product market

2.1. The egg sector

Table 2.1 Presents the EU-25 balance sheet for shell eggs. The EU-25 produced some 6.806 million tonnes of eggs (an increase of approximately 10% between 1995 and 2007, but well within the range seen over this period). Among reasons for fluctuations in production are periodic outbreaks of Avian Influenza, most notably in the Netherlands and Belgium in 2003 (hence the large increase in imports in this year), but also Italy in 2001. Per capita consumption figures are only available from 2004, but show a slight decline over the period.

Table 2.1: EU-25 egg balance sheet ('000 tonnes unless noted)

	1995	2000	2001	2002	2003	2004	2005	2006	2007
EU-25 production	6,177	6,693	6,785	6,814	6,511	7,097	7,003	6,733	6,806
Imports	12	28	24	33	74	25	29	39	43
Exports	167	194	203	203	156	197	196	203	184
Hatching eggs, losses and industrial use	429	480	516	490	500	536	622	490	643
EU-25 consumption	5,593	6,047	6,090	6,155	5,929	6,389	6,214	6,079	6,022
Per capita consumption (kg)						15.09	14.87	14.25	14.42

Source: DG Agri and Agra CEAS Consulting calculations.

Egg production information has been unavailable centrally at the Member State level since 2003, but, according to the industry, there have been no major changes in relative Member State production since then. Data from 2003 are presented in Figure 2.1 and show that the main EU-25 egg producers are Spain, France, Germany, Italy and the UK who together account for two thirds of EU-25 production. Poland is the only new Member State with an appreciable share of total EU-25 production at 7%, almost as much as the remaining new Member States put together (8%).

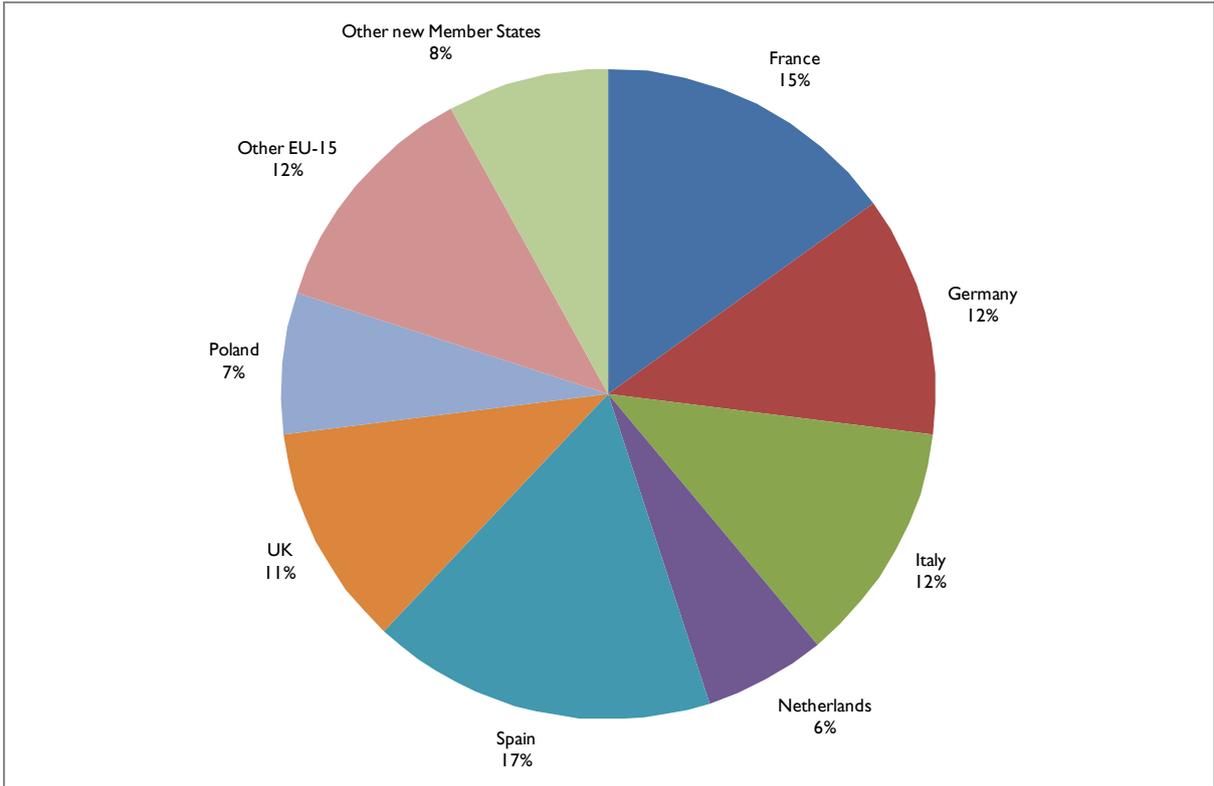


Figure 2.1: Egg production by Member State, 2003

The majority of eggs in the EU-25 are produced from hens in traditional battery cages, although from January 01, 2012 these systems will no longer be permitted under Directive 1999/74/EC. Laying hens will instead have to be housed in enriched cages or in alternatives such as free range or barn systems. Information on the proportions of laying hens kept in different systems is not available in a consistent form across the EU since the EU Commission discontinued the publication of the data it held. However, the International Egg Commission collates data on the use of different production systems in 16 of the 27 EU Member States (although does not differentiate between traditional cages and enriched cages). Table 2.2 presents the proportion of laying hens kept in alternative production systems for 1995, 2000 to 2002 based on EU Commission data and from 2003-2006 using International Egg Commission data. Whilst mixing data sources is less than ideal this does at least provide an overview of general trends.

Table 2.2: Non-caged egg production in selected Member States (percentage)

	1995	2000	2001	2002	2003	2004	2005	2006
Austria				28	47	54	54	70
Belgium				4				13
Cyprus					9			
Czech Republic					20			30
Denmark	22	43	37	44	42	42	42	47
Estonia					20			
Finland	0	4	5		13	13	13	14
France				15	19	21	21	21
Germany				16	23	27	27	29
Greece	0	0	0	0	10			10
Hungary					50	50	50	7
Ireland	7	15	16	31	20	20		32
Italy	0	1	1		4	3	3	9
Netherlands	12	22	15		53	53	53	53
Portugal					2			
Slovakia						30		30
Spain				0	1	1	1	2
Sweden	11	16	21		62			61
United Kingdom	12	26	26		37	36	36	37

Sources: EU Commission and International Egg Commission.

The type of alternative system in use depends on the Member State. Barn systems are more common in colder Member States where outside access is not practicable all year round and where there is a tradition of barn eggs (for example, Sweden and Finland). Free range systems are the dominant alternative production system in the UK and Ireland. Other Member States have more equal proportions of barn and free range production systems (for example, Germany, Austria and Denmark).

2.2. The egg processing sector

The total egg industry is, in many Member States, highly concentrated with substantial portions of the chain being integrated in that pullet rearing, feed supply, production, processing and marketing to the retailer are all undertaken by a single company or co-operative. Examples include Eurovo in Italy (the largest producer of egg products in the EU, see Section 2.3, Table 2.3), Deutsche Frühstücksei in Germany, Danæg A/S in Denmark and Noble Foods in the UK. In other Member States such as Portugal and Greece the egg production industry is relatively fragmented and the packing/processing sector is not so concentrated.

Commercial egg drying began in the late 19th century with frozen whole eggs introduced at around the same time. Separated egg products became available soon after this with commercial egg

breaking machines introduced a little over 50 years ago². The egg product market began as a way of utilising second quality eggs (those broken, dirty or otherwise damaged in a way that precludes sale as shell eggs), and thereby turning a waste product into a profit, but it has now outgrown this. For example, some 29% of eggs consumed in the UK are in product form (although this figure includes boiled eggs which are usually not considered as direct egg products). However, second quality eggs in the UK only account for between 8% and 9% of total egg production. What are referred to as “distressed first quality” eggs (bumpy shells, odd sizes, etc.) are also surplus to the shell egg sector and are sold into breaking at cost. Finally, some first quality eggs are also required and some businesses (or business units) have been set up specifically to produce eggs for breaking. Unlike the previous two categories, these have to make money from the egg product market. The majority of eggs for breaking are procured on contract. Beyond this there are deals with producers for end of lay first quality with some eggs sourced from the spot (wholesale) market. This procurement process is similar across the EU, although the extent to which first quality eggs are required depends on the size of the egg processing sector in each Member State.

According to industry sources, the egg processing sector currently accounts for some 28%-30% of total egg production in the EU-15 (some 1.5 million tonnes of egg products) and is growing by some 1.0% to 1.5% annually as a result of the growing trend towards the use of processed and convenience food and the increasing proportion of meals taken outside the home. Alongside this trend there is rising demand for “safe” food products. Food safety is a rationale for using egg products rather than shell eggs as a result of pasteurisation (no risk of salmonella etc.). There are also convenience benefits in that there is no need to break eggs, dispose of shells and the risk of shell getting into the food is removed. However, for certain uses, such as frying, shell eggs are still necessary and in other cases/markets they might be preferred, for example by chefs promoting the use of “real” food. Finally, there is a belief among some in the industry that an unpasteurised egg provides a better whip because the pasteurisation process alters the proteins to some extent.

The egg processing sector is highly concentrated with many Member States (for example, Sweden, Finland, Denmark, Portugal, Greece, Austria, Belgium and Ireland) having less than four processors. Where processors are limited in number they tend to focus on breaking second quality eggs, mainly for the domestic market and usually liquid products only, although they may also produce blends and mixes to capture greater added value.

The dried egg sector is even more concentrated than the liquid egg sector. This is partly due to economies of scale and also the fact that powdered products can be transported more cheaply than liquid products as a result of weight differentials and storage issues. The main egg driers in the EU are located in France, the Netherlands, Belgium, Scandinavia and Italy. According to industry sources, Lithuania, Estonia, Latvia, Slovakia, the Czech Republic, Romania and Bulgaria have one

² The pasteurisation of eggs for use in products started in the late 1950s. The UK introduced a government act to combat salmonella in processed eggs in 1963. Extended pasteurisation, which offers greater salmonella protection, began in the 1980s in the US in response to a salmonella outbreak in a Chicago hotel.

drying facility each³, whereas Poland currently has two egg dryers. There are no drying facilities at all in several Member States (for example, UK, Ireland, Portugal, Luxembourg, Austria, Greece, Malta and Cyprus), generally because of prohibitive investment costs and lack of scale economies⁴.

According to industry sources, some egg drying operations are only economic because of Inward Processing Relief. Under this, shell eggs can be imported from third countries without tariff as long as equivalent egg product is exported to third countries without export subsidy within 6 months. This underpins some egg drying businesses and allows sufficient scale to make drying for the EU market economically viable.

The outlook for the EU egg products sector is positive with demand in the catering and restaurant business expected to grow. Growth is also expected in the convenience food market. The US egg product market accounts for some 35% of total US egg consumption and the EU industry believes that egg products in the EU could achieve similar market penetration. It is also possible, though considered unlikely by some industry players, that liquid egg products could gain market share in retail outlets. Small amounts of liquid, pasteurised egg yolk can be bought in retail outlets in Scandinavia, although the experience of trialling these products in the UK was not a success with concerns over lack of versatility and inferior shelf-life compared to shell eggs and associations with inferior product stemming, in part, from the use of dried eggs under war-time rationing.

2.3. EU egg processing companies

The EU egg products market is dominated by a relatively small number of large operators. These are set out in Table 2.3 with their estimated market share. As the Table shows, a little more than 40% of the EU egg product market is accounted for by 9 companies who in many cases operate in more than one Member State.

³ Latvia may have two drying facilities.

⁴ For example, the UK company Framptons stopped egg drying about ten years ago because it was not economic at the scale at which they were operating.

Table 2.3: Main EU egg processors and estimated market shares

Company	Estimated annual production (tonnes of egg product)	Market share
Eurovo (Italy, Spain, France, Romania, Poland)	150,000-250,000	10%-16.7% ⁵
WEKO (Netherlands, Austria, Poland, Spain)	100,000-120,000	6.7%-8.0%
Sanovo (Denmark, Germany, Spain)	70,000	4.7%
IGRECA (France)	70,000	4.7%
Parmovo (Italy)	70,000	4.7%
Bouwhuis Enthoven	40,000-60,000	2.7%-4.0%
Ovobest (Germany)	35,000	2.3%
EIPRO (Germany)	30,000	2.0%
Geslin (France)	30,000	2.0%
Sub-total	625,000-665,000	41.7%-44.3%
TOTAL	1,500,000	

Source: Industry estimates and Agra CEAS Consulting calculations.

Generally, the EU egg product industry is located in the EU-15, as the egg processing industries in new Member States are generally currently embryonic. There is, however, some production in some new Member States. The two largest egg producers in the new Member States are Poland and Hungary and egg product production in Poland is increasing rapidly with a new processing plant having been built recently. There is also limited production for domestic consumption in the Czech Republic, Estonia, Lithuania and Latvia. However, most new Member States are net importers of egg products and there is currently no egg product production at all in, for example, Slovenia, Bulgaria or Romania.

A lot of egg processing companies in new Member States are joint ventures with EU-15 egg processing companies. These bring technical knowledge with local companies supplying local sourcing contacts and language capability. The main rationale behind setting up plants in these countries is the perception of relatively cheap production costs (mainly egg costs, but also labour). There are also often grants available for set up. Second quality eggs in these Member States is already being processed elsewhere, but processors can reduce costs by processing them in the country of production.

According to industry sources, the largest egg processors in selected Member States are as follows in Table 2.4.

⁵ Industry sources were not entirely clear on Eurovo's market share. It was estimated to be at least 10% up to a maximum of some 16.7%. The complicated ownership structure of many companies under the Eurovo label was cited as the reason for this confusion.

Table 2.4: Largest egg processors in selected Member States

Member State	Company
Austria:	Pro-Ovo/WEKO
Belgium:	Belovo
Denmark:	Sanovo Foods A/S and Danaeg (share market approx. 50/50)
France:	IGRECA S.A.
Germany:	Ovobest Eierprodukte GmbH
Italy:	Eurovo and PARMOVO (approximately the same size)
The Netherlands:	Van den Burg/WEKO and Bouwhuis Enthoven
Portugal:	Derovo
Spain:	Pascual de Aranda and Dervo (market share approx. 50/50)
Sweden:	Källbergs Industri Ab
UK:	Noble Foods ⁶

Consumption of egg products as a proportion of total egg consumption is higher in the EU-15 than in the new Member States. In some Member States it is particularly high. In Italy, for example, it is around 30% as a result of the pasta industry and Italy is proportionally the largest consumer of egg products in the EU. There are some 50 egg processors in Italy, but only around ten of them are considered to be significant in terms of size/market share. The proportion of egg products produced in Belgium is also quite high with significant intra-EU exports. The reason for this is less clear, although it may be to do with location near the Netherlands through which a lot of trade takes place. The use of egg products (not including cooked and peeled) in the UK is probably a bit lower than the EU-15 average, but will be above the EU-27 average.

2.4. The main egg products

In general, the egg product market can be split into two major categories:

- the whole egg market, which accounts for some 70% of the market; and,
- the separated egg market, which accounts for the remaining 30% of the market (two-thirds of which is egg white (albumen) and one-third egg yolk.

Within these categories, egg products can be split into three further groups in terms of product consistency:

- liquid, which makes up some 80% of the market;
- dried (powder), which makes up some 19% of the market; and
- frozen, which makes up some 1% of the market⁷.

⁶ Further consolidation of the UK egg products industry would seem unlikely, at least as far as the major players are concerned. The Competition Commission has recently ruled that the merger between Stonegate and Deans in June 2006 has to be undone due to the scale of the combined business (Deans alone accounted for 40% of the UK egg market prior to merger and 25% is usually the point at which the competition authorities begin to investigate the impact on competition). The Stonegate business will therefore have to be sold off and two bids are currently going forward for further consideration. It is possible, although considered unlikely by the industry, that there could be some consolidation of smaller players in the UK.

As well as their more obvious uses, egg products are used as food additives, for example, to add more protein to food. Egg products are used to add colour and taste to a product, or to enhance other flavours. They are also used for their functional abilities (for example, for structure and coagulation purposes). There is no exhaustive list of egg products, as many different compositions of egg products are possible and egg product producers will make up any product according to client needs.

Both whole egg and separated egg products can be divided into three broad product categories:

- the pure product;
- the product with sugar added; and,
- the product with salt added.

However, other additives, such as citric acid, may also be added to whole egg products, albumen and egg yolk products. Egg processors often prepare egg products according to special, and often secret, formulas, which are custom-made for a specific buyer. Finally, it is possible for an egg product to contain salt, sugar and other additives.

Where sugar and/or salt is added, this can be at varying proportions (see below). However, it is not possible to determine typical proportions as there are simply too many product varieties. That said, 12% is the maximum amount of salt contained in egg products as beyond this the viscosity of the product is adversely affected. All these varieties of egg products can exist in liquid, dried or frozen form.

The dried products sector is growing in the EU in absolute and proportional terms at the expense of liquid products⁷. Essentially this switch is occurring because dried product has a longer shelf-life and is easier to store. Whilst historically the functionality of dried egg was considered inferior to liquid egg this is no longer the case (although some industry players still feel there is some functional advantage to a liquid product). The two products are essentially interchangeable with suitable modifications to the further processing systems (for example, dried egg might be added at a different stage in comparison to liquid eggs, it may require pre-rehydration or it might be mixed straight into other dry ingredients, depending on the process). However, a major European food manufacturer only uses liquid eggs for all of its products (with the exception of soups), because they consider that the liquid product adds superior quality, for example by creating a better mouth feel in products such as mayonnaise. They also claim that liquid egg has better emulsifying abilities. On a global level, the most efficient producers in the dried egg sector are in the US, India and South America.

⁷ Some industry sources noted that frozen products account for less than 5% of the egg product market. In either case this is the least important market segment and the use of frozen product is declining for convenience reasons.

⁸ For example, the Mr Kipling brand in the UK has fairly recently switched from liquid to dried product.

The major advantage of dried egg products is their extended shelf-life and the cheaper transportation costs associated with them (they are lighter through being dehydrated and do not need to be chilled). The main disadvantage is that they are often more treated than the liquid or frozen products which can result in a requirement for a larger quantity than liquid product because they can lose a degree of functionality. The biggest disadvantage of using frozen egg products is that it may not always be possible for an egg product user (food producer, caterer, etc.) to calculate precisely the amount of product needed for the next day. There is therefore a risk of loss when too much of the product is defrosted and not fully used. On the other hand, there is also a risk that an insufficient quantity is defrosted. This inconvenience is a major factor in the decline of the use of frozen egg product.

In addition to the three main types of egg products (whole egg, albumen or yolk) and their use as an additive, a number of further processed egg products exist. This category includes, for example, long eggs, as well as value-added products such as scrambled egg and pancake mixes. Peeled and cooked products, for example eggs used in sandwiches, are not considered to be egg products. However, in most EU countries there are one or two egg processors that have cooking and peeling facilities. According to industry sources, the cooking and peeling industry is growing.

Egg products have several by-products that can be used for various purposes. A widely used by-product is lysozyme, which is present in egg white where it accounts for 3% of total protein. Lysozyme is used as a natural preservative in many food applications and is also used for pharmaceutical products, such as creams. It is used to extend the shelf life of certain products (for example, cheese) and to preserve the freshness of salads that are served at buffets/salad bars. Lysozyme is also used for wine purification purposes, as it inhibits the growth of certain lactic acid bacteria that can cause sluggish fermentation and reduce wine quality. Lysozyme exists in dried and liquid form, but is mainly used in its dried form. Another by-product of egg products is egg lecithin, which consists of phosphor lipids, which can be extracted from egg yolk. Egg lecithin is mostly used by the medical industry, for example in intravenous nutrition, and by the food industry, especially for dried baby food.

Table 2.5 below summarises the main functional rationales behind the usage of egg products by industry.

Table 2.5: Functional rationales behind the usage of egg products by industry

Industry	Main functional rationale
Baking <ul style="list-style-type: none"> Breads, pastries, cakes, biscuits 	<ul style="list-style-type: none"> add richness add volume and height to cakes increase volume used in pastry where lighter texture is required used to thicken frosting and fillings
Confectionary <ul style="list-style-type: none"> Bars, fillings, fondants 	<ul style="list-style-type: none"> add richness and flavour stabilize improve interior texture used to control crystallization of water molecules
Dairy <ul style="list-style-type: none"> Ice cream, frozen desserts 	<ul style="list-style-type: none"> improve texture add flavour decrease melting point used to control crystallization of water molecules
Sauces <ul style="list-style-type: none"> Mayonnaise, salad dressings, dips 	<ul style="list-style-type: none"> bind sauces emulsify mixtures of oil and water
Meal replacements <ul style="list-style-type: none"> Energy bars 	<ul style="list-style-type: none"> provide high protein source other functional benefits
Beverages <ul style="list-style-type: none"> Dietary drinks, yoghurt drinks 	<ul style="list-style-type: none"> add creamy texture
Prepared food <ul style="list-style-type: none"> Ready meals, frozen food products 	<ul style="list-style-type: none"> improve texture a product's freeze, thaw and microwave capabilities used to control crystallization in frozen food items, e.g. dough.

Source: Agra CEAS based on Egg Nutrition Center and enotes. <http://www.enotes.com>

A major European food manufacturer interviewed as part of this research explained that they use mainly liquid egg products, with the most widely used product being salted egg yolk. The next most important egg product is a blend of whole egg and egg yolk with sugar and salt added. Taken together these two egg product categories comprise some 50%-60% of total egg products used by this manufacturer. Sugared egg yolk is also used to a relatively large extent, mainly for the production of ice-cream. Dried egg products (including whole egg, egg yolk and egg white) are only used as an ingredient in dried and liquid soups.

Descriptions of the main egg products are provided in the following text boxes.

PURE WHOLE EGG

Product description:	<i>Pasteurised pure whole egg.</i>
Shelf life:	<ul style="list-style-type: none"> • Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i> • Frozen: <i>usually lasts up to one year.</i> • Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Pure whole egg is used for its structural ability both as a foaming agent and for coagulation purposes. Whole egg powder has emulsifying and structural ability and enhances fat condensation. Whole egg powder generally plays the same role as egg yolk powder, but adds more protein.</i>
Main applications:	<i>Pastry, cakes, ice cream, biscuits, omelette, scrambled eggs, pasta, pies, bread, mayonnaise, sauces, meat products.</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Pure whole egg products make up the largest share of the whole egg product market.</i>

SUGARED WHOLE EGG

Product description:	<i>Pasteurised whole egg with sugar added. The amount of sugar added varies between 1% and 50%.</i>
Shelf life:	<ul style="list-style-type: none"> • Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i> • Frozen: <i>usually lasts up to one year.</i> • Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Sugared whole egg is used for its structural ability both as a foaming agent and for coagulation purposes. Sugared whole egg powder has emulsifying and structural ability and enhances fat condensation.</i>
Main applications:	<i>Cakes, confectionary and pastries.</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Sugared whole egg products make up the second largest share of the whole egg product market.</i>

SALTED WHOLE EGG

Product description:	<i>Pasteurised whole egg with salt added. The amount of salt added varies between 1% and 12%.</i>
Shelf life:	<ul style="list-style-type: none">• Liquid: at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.• Frozen: usually lasts up to one year.• Dried: usually lasts for one year or, in some cases, even longer.
Functionality:	<i>Salted whole egg is used for its structural ability both as a foaming agent and for coagulation purposes. Salted egg powder has emulsifying and structural ability and enhances fat condensation.</i>
Main applications:	<i>Mayonnaise, dressings, ready meals and meat products.</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Salted whole egg products account for the third largest share in the whole egg product market.</i>

PURE EGG WHITE (ALBUMEN)

Product description:	<i>Pasteurised pure egg white.</i>
Shelf life:	<ul style="list-style-type: none">• Liquid: at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.• Frozen: usually lasts up to one year.• Dried: usually lasts for one year or, in some cases, even longer.
Functionality:	<i>Pure egg white is used for its whipping ability and foam ability and stability or for gelling and water binding abilities (especially dried/powder egg white). Also, it improves elasticity of meat and seafood products and makes some types of food (e.g. instant noodles) more elastic.</i>
Main applications:	<i>Cakes, pastry, candy, soups, seafood and meat products (e.g. crab meat, sausage), instant noodles and solid beverages (e.g. high protein beverages used as food supplement).</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Pure egg white makes up by far the largest part of the egg white product market. This is due to the product characteristics. Egg white only has whipping ability in its pure form.</i>

SUGARED EGG WHITE (ALBUMEN)

Product description:	<i>Pasteurised egg white with sugar added. The amount of sugar added varies between 1% and 50%.</i>
Shelf life:	<ul style="list-style-type: none"> • Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i> • Frozen: <i>usually lasts up to one year.</i> • Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Sugared egg white is used for its whipping ability and foam ability and stability or for gelling and water binding abilities (especially dried/powder egg white).</i>
Main applications:	<i>Cakes, biscuits and pastry.</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Sugared egg white (albumen) is the second largest product category of the egg white product market.</i>

SALTED EGG WHITE (ALBUMEN)

Product description:	<i>Pasteurised egg white (albumen) with salt added. In the case of albumen, usually only small amounts of salt are added (some 1%-2%). This is due to the fact that salted egg white is often added to meat and seafood products and too much salt would affect the taste. Added salt is also limited for health reasons.</i>
Shelf life:	<ul style="list-style-type: none"> • Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i> • Frozen: <i>usually lasts up to one year.</i> • Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Salted egg white is used for its whipping ability and foam ability and stability or for gelling and water binding abilities (especially dried/powder egg white). Also, it improves elasticity of meat and seafood products and makes some types of food (e.g. instant noodles) more elastic.</i>
Main applications:	<i>Salted egg white is used for meat and seafood products (fake crab meat).</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Salted egg white (albumen) is the third largest product in terms of market share within the egg white product market.</i>

PURE EGG YOLK

Product description:	<i>Pasteurised pure egg yolk.</i>
Shelf life:	<ul style="list-style-type: none">• Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i>• Frozen: <i>usually lasts up to one year.</i>• Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Pure egg yolk is used for its emulsifying and structural abilities. It is also used to add taste and colour to products.</i>
Main applications:	<i>Mayonnaise, sauces, pasta, cakes, pastry, biscuits and ice-cream.</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies that produce, for example, ready meals.</i>
Importance of the product:	<i>Pure egg yolk accounts for the largest share of the egg yolk product market.</i>

SUGARED EGG YOLK

Product description:	<i>Pasteurised egg yolk with sugar added. The amount of sugar added varies between 1% and 50%.</i>
Shelf life:	<ul style="list-style-type: none">• Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i>• Frozen: <i>usually lasts up to one year.</i>• Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Sugared egg yolk is used for its emulsifying and structural abilities. It is also used to add taste and colour to products.</i>
Main applications:	<i>Cakes, pastry, biscuits, ice-cream.</i>
Used by:	<i>Bakeries, catering services, restaurants, food processing companies.</i>
Importance of the product:	<i>Sugared egg yolk is the third largest product category of the egg yolk product market.</i>

SALTED EGG YOLK

Product description:	<i>Pasteurised egg yolk with salt added. The amount of salt added to yolk varies between 1% and 12%.</i>
Shelf life:	<ul style="list-style-type: none"> • Liquid: <i>at 0-4° C the unopened, refrigerated product lasts for 7 to 20 days. On average the refrigerated product is processed within one week.</i> • Frozen: <i>usually lasts up to one year.</i> • Dried: <i>usually lasts for one year or, in some cases, even longer.</i>
Functionality:	<i>Salted egg yolk is used for its emulsifying and structural abilities. It also is used to add taste and colour to products.</i>
Main applications:	<i>Mayonnaise, delicacies, dressings, sauces.</i>
Used by:	<i>Catering services, restaurants, food processing companies that produce, for example, mayonnaise and ready meals.</i>
Importance of the product:	<i>Salted egg yolk products account for the second largest share of the egg yolk product market, as it is the main ingredient of mayonnaise.</i>

3. Egg and egg product purchasing criteria

3.1. Egg purchasing criteria

Egg purchasing within the **egg processing sector** is straightforward. The most important criteria is price (encompassing production and transport costs), given certain standards of traceability, hygiene and production standards. These though do not differ hugely within Member States of the EU. Some egg processors are known to source eggs globally and buy up quantities of eggs for storage when the price is low. However, price is not the only factor taken into consideration according to the industry. Country of origin is important in some markets, for example in France and Scandinavian countries where there is a preference for domestic product (in the Scandinavian case partly the result of salmonella-free status and a consequential highly positive image for domestic eggs).

The majority of egg products are sold directly to the end user. Multinational companies and large pasta producers usually buy directly from the processors. Intermediaries, for example traders buying products in third countries, are mainly used for products of non-EU origin.

3.2. Egg product purchasing criteria

In general, **food manufacturers** select egg product on price, quality, service standard, traceability and location (for practical reasons to do with securing the supply chain and also, as a relatively new phenomenon, to reduce food miles). A major European food manufacturer indicated that security of supply is the most essential buying criteria, followed by price. Suppliers are chosen on the basis of the level of service they provide, including quality, flexibility and time management abilities (i.e. lead time to deliver products). The suppliers are expected to ensure traceability of the eggs, with the only condition from the side of the food manufacturer interviewed being that the eggs/egg products have to be sourced in the EU. It is not known how widespread the insistence on EU eggs is within the food manufacturing industry. However, a major fast food restaurant chain also sources its non-cage eggs and egg products exclusively in the EU. This restaurant chain's strategy is to source its eggs and egg products within the Member State in which it is selling and only to source in another EU country when there is a local shortage of supply.

In terms of the egg product supply chain, industry sources indicate that the majority of egg products are sold directly to the end user in Europe. Multinational companies and large pasta producers usually buy directly from egg processors. The wholesale market is mainly used for products of non-EU origin.

Transportation costs are not a decisive factor when considering from where to buy egg products. The need for reducing risk (security of supply) overrules considerations on potentially higher transportation costs, given that, at least as far as this manufacturer is concerned, sourcing only takes place within the EU. A major fast food restaurant chain supports the view that suppliers are

primarily chosen on the basis of the level of service they provide, including quality, as well as their compliance with animal welfare and food safety standards and social accountability standards. Prices are only negotiated if a supplier fulfils these essential criteria. The main focus of this particular fast food restaurant chain is to develop and maintain long-standing relationships with their suppliers.

Functionality (i.e. the technical capability of the product) can be important for certain products. The product range offered by an egg processor is also important in that offering a range of products allows the food manufacturer to have one supplier of egg products rather than two or three. However, this is probably dependent on scale to some extent with large food manufacturers using several suppliers in order to spread risk as well as to promote competition amongst its suppliers. Spreading risk is seen as being particularly important with regard to the possibility of interruptions to supply caused by, for example, an outbreak of avian flu in one country.

When ordering egg products, the egg processor is supplied with information on the quality specification, logistics and the physical characteristics of the egg product required. In particular, food manufacturers tend to specify the following to their suppliers:

- the type of product required (egg yolk, egg white, whole egg or a mixture of egg products);
- shelf-life;
- microbiological features; and,
- the type of packaging required.

The food manufacturer does not usually indicate which quality of egg (first, distressed first or second) should be used to make the egg product, but when caged eggs are used they are generally second quality, whereas egg products based on non-caged eggs and usually derived from first quality eggs (see Section 5)..

4. Use of eggs in processed food and products

Some 80% of egg products are for human consumption and are used by the food industry. A maximum of 20% go into technical applications (pet feed, wine filtration, cosmetics, etc.). The majority of processed eggs for human consumption (between 70% and 80%) go into food processing whilst the remaining proportion is used in the catering industry (restaurants and institutional catering). Demand from these two sectors differs for some Member States with, for example, the UK having a larger demand for liquid egg products in the catering sector due to the popularity of egg-based breakfasts from chains such as McDonalds.

Most eggs used in catering are either pasteurised or pre-cooked and products used include some frozen and liquid egg, but mainly ready-to-serve products such as scrambled egg, omelettes and boiled eggs. Pre-cooked fried and poached eggs are also available. The use of extended shelf life⁹ liquid egg products is increasing in the catering sector.

In the food manufacturing industry, liquid egg is often pumped straight into mixing points in the baking industry. Whole egg is often used where foaming and coagulation properties are required, such as in the production of cakes. Egg whites are used in the manufacture of meringues and light sponges, products which rely on foaming.

Egg blends, for example egg whites with added sugar, are increasingly used in preference to basic egg components because these simplify subsequent operations and often improve the quality of final products. The use of frozen egg products is declining in food manufacturing because they do not offer the same levels of convenience as other products. Dried egg products are typically added straight into mixes with no prior rehydration for simplicity.

4.1. Main products using processed eggs

There is a wide variety of processed food products that use egg products. In addition, some non-food products, such as pharmaceutical and personal care products (shampoo, soaps, etc.) use egg products. The following are the major items using egg products:

- dressings (including mayonnaise);
- sweet pastry/confectionary products;
- salted bakery products;
- pasta;
- ice-cream;
- soups in powder and liquid form;
- ready meals and frozen meals; and,
- personal care products.

⁹ Extended shelf life is achieved through pasteurisation at higher temperatures for a shorter period of time than normal followed by packaging in a protective environment.

In general, industry sources estimate that bakery/pastry products, dressings and pasta make up some 70% of the total market, with bakery and pastry together accounting for some 40% to 50%. Personal care products account only for a very small proportion of the total market. However, the market share of each of these product categories depends on the individual food manufacturer's portfolio. In the case of the food manufacturer interviewed for this research, dressings (including mayonnaise) account for some 75%, ice-cream and soups for some 10% each, with ready meals/frozen meals and personal care products accounting for the rest of production. Given the different focus of different food manufacturers it is not likely that this breakdown reflects the total market.

The proportion of egg in each of those product categories varies significantly. It is difficult to make a general distinction according to the different categories, as the proportion of eggs used will also largely depend on the individual food manufacturer's ingredient formula for specific products (e.g. in the case of ice-creams or soups)¹⁰. The same logic applies to the proportion of cost accounted for by eggs in the different processed products. This information is considered to be commercially sensitive and was not made available to the researchers.

¹⁰ The only straightforward case is full fat mayonnaise, where eggs account for some 10% of total ingredients.

5. Use of eggs from non-caged birds

5.1. Market for non-caged egg products

There is an EU market for egg products using non-caged eggs, although this is essentially a concern in just a few Member States (mainly the UK, Ireland, Austria, the Netherlands, Germany and Sweden) and non-caged products are produced to order. Currently the UK is the largest market for non-caged eggs and egg products. In general terms, in the southern, central and eastern Member States there is a relatively low level of awareness/concern about egg production methods.

Clearly, not only the attitude of consumers, but also that of egg suppliers influences the development of the market for eggs/egg products from non-caged birds. In order to increase the use of non-caged production systems it is crucial that the supply side is committed to such a move. According to industry sources, suppliers of eggs and egg products, including farmers and egg processors, tend to have a relatively conservative point of view on the use of non-cage production systems in most Member States. Cages are the most economically efficient form of production system and are also often considered by suppliers to ensure better food safety through reduced risks of contamination, poor hygiene and traceability problems (because fewer suppliers are required as caged systems are larger scale). As long as cage systems remain the dominant production system in Europe it seems unlikely that food manufacturers will shift to the use of non-caged egg products on a large scale due to supply issues.

Overall, the EU market for egg products from non-caged hens is very small accounting for between 2% and 5% of total eggs used in egg processing. The UK is at the forefront of the non-caged egg product market in the EU and some 15% of the UK liquid egg market uses eggs from non-caged production systems (almost exclusively free range systems) and this is why the companies using non-caged products tend to be UK based¹¹. This proportion is set to increase from March 2008 as Hellmann's Mayonnaise is reformulated to contain free range eggs. Industry sources suggest that this mayonnaise will initially only be marketed in the UK, although it is considered likely that this will be extended to selected other European countries if demand for, and supply of, non-caged egg products is sufficient. Currently, the non-caged egg products¹² used in Hellmann's mayonnaise are sourced in the UK, the Netherlands, France and Italy.

The use of non-caged egg product in the UK market was pioneered by McDonalds who were followed by Marks & Spencer who are the only UK retailer selling only non-caged egg products because they only market own-brand products. There is currently some interest in non-caged egg products from major chains (for example, IKEA) for use in staff restaurants. The Little Chef chain began using non-caged eggs and egg products in 2007.

¹¹ There are, of course, others such as Dr Oetker in Germany, but it was not possible to establish a comprehensive list of companies using non-caged egg products.

The market for non-caged egg products is mainly restricted to liquid egg with the proportion of non-caged powdered egg products being very small, although, for example, Quorn uses free range powdered egg white.

There is clearly going to be an increase in demand for non-caged eggs for egg products in the UK following the Hellmann's decision to use free range eggs and given the other interest in free range egg products. The Co-op also ceased marketing shell eggs from caged hens in February 2008 and this may result in additional demand for free range eggs¹³. It should also be noted that the demand for free range shell eggs increased in the UK by around 2%-3% in 2007 in any case¹⁴. However, it is not necessarily straightforward to increase the supply of free range eggs to meet this demand as a result of, amongst other issues, planning laws. One solution for the UK might be to abandon the UK-specific free range stocking densities (1,000 birds per hectare) and move towards the EU free range stocking density (2,500 birds per hectare). There would also be a loss of protection from the Lion symbol which currently identifies eggs as UK production.

5.2. Price issues

There are likely to be implications in terms of price if demand for egg products from free range (or other alternative systems) increases. As discussed earlier in this report (Section 2.2), the caged egg products market uses second quality eggs, distressed first quality eggs and first quality eggs. Taken together the blend is at or below the cost of production due to the utilisation of otherwise unsaleable eggs. A move to the use of non-caged egg for egg product production usually implies a move from this blend to first quality free range eggs¹⁵ and this implies a large price difference. This complication was the reason why Marks & Spencer ceased sales of caged shell eggs in 1997, but waited until 2002 to introduce non-caged egg products.

The price at which liquid free range egg products are sold is about 50% higher than caged liquid product. Although in theory it should be possible for retailers/food manufacturers to obtain a price premium for non-caged egg products, this is not always possible in practice. Marks & Spencer switched to non-caged eggs to better reflect their branding as a premium food retailer and recouping the cost was not seen as being of central importance, although a mix of reformulations and different pack numbers and sizes increased price in a less obvious way. It is possible that the decision to use free range egg in Hellmann's Mayonnaise may not be advertised because of concern that consumers already assume that free range eggs are used. In any case, it should be borne in mind that the extra cost of egg in the final product is often small. In the case of an egg sandwich (which typically would use one egg) the extra cost incurred by using free range egg is around €0.05. However, in

¹² For the production of Hellmann's mayonnaise only liquid egg products are used.

¹³ Although consumers may decide to switch to alternative suppliers or may select barn eggs in preference to free range.

¹⁴ However, short-term trends can be misleading. For example, in 2007, sales of cage value eggs increased more than sales in any other sector in the UK due to very low retail prices, often below cost. Sales of cage standard eggs were down, as were barn and organic sales. In the case of organic this was due mainly to disproportionate price increases.

¹⁵ The non-caged eggs used tend to be first quality because second quality non-caged eggs are usually used with other second quality eggs in undifferentiated egg products (unless there is sufficient demand for non-caged egg products to justify keeping second quality non-caged eggs separate).

mayonnaise the egg content can be as high as 20%, so there will be a bigger impact on final product cost.

5.3. Identity preservation

Non-caged egg products are identity preserved either in time (by stopping the processing line and cleaning down) or by using different processing lines. There is always full traceability in terms of processing line and time. There are also typically one or two independent customer audits a week. When operating, the highest standard egg is used first (in this case free range) so any residue would cascade into the next highest standard egg product in the same way as the egg packing process works (essentially having some free range egg in a caged egg product is not a problem whereas caged egg in a free range product would be a problem). The processing machinery is usually stopped and cleaned every two hours in any case and this affords the opportunity to change the type of egg being processed¹⁶. The most economically efficient plant would only use eggs from one type of production system and not both. However, although there is some segregation cost and there is a reduction in plant operating efficiency, this is considered by the industry to be manageable.

5.4. Quality issues

There are no quality differences between caged and non-caged eggs once made into products. There may be some quality differences at farm, but these are selected out or washed before the egg gets to the processing plant. There may be some greater variation in yolk colour, but when the product is all mixed together this is masked in any case. These differences in quality are mainly related to scale in that one producer might supply all the eggs for caged egg processing, but the same quantity of free range eggs would need to be sourced from a number of producers and this implies greater variation.

5.5. Marketing issues

When food manufacturers have products using eggs from non-caged eggs in their portfolio, they usually advertise this fact and use it as a marketing tool. Today, mainly premium/high-end products are sold on the basis of non-caged egg content. However, in some countries, like the UK and the Netherlands, more standard products, such as certain brands of mayonnaise, use non-caged eggs.

Some 90% of all eggs and egg products used by a major fast food restaurant chain in Europe¹⁷ come from non-cage production systems. However, this restaurant chain only advertises the fact that it uses non-caged eggs in some Member States, specifically where it considers that consumer awareness of this issue is high (for example, in the UK), where breakfast products¹⁸ are sold in their restaurants and where promoting the fact that non-caged eggs are used thus provides a competitive advantage to the company.

¹⁶ Some big new facilities might operate for 10 hours in one run.

¹⁷ The European market of this restaurant chain encompasses 40 countries (27 EU and 13 non-EU countries, such as Russia). In all European countries mainly free-range eggs/egg products are used, with the exception of some countries, e.g. Russia, where, due to extreme weather conditions, free-range eggs are not available on a large scale and eggs from barn systems are used instead.

¹⁸ In terms of importance regarding the use of eggs/egg products, breakfast products (such as scrambled eggs and egg sandwiches) use most eggs and egg products, a minor share is used in some types of salads. Currently, the restaurant chain offers breakfast products in some 26 out of 40 countries, but it is likely that breakfast products will be offered in more countries in the future.

When food manufacturers shift from the use of caged to non-caged egg products this usually entails an increase in product price. Food manufacturers therefore partially base their decision to shift to non-caged eggs on their understanding of consumer perception and willingness to pay. Brand identity can also play a role, as was the case with the decision of Marks & Spencer to cease sales of all products containing caged egg.

Consumer perceptions on non-caged eggs vary greatly across Europe (see above). In Member States where awareness levels around eggs from non-caged birds are high, food manufacturers are more likely to be able to sell products containing non-caged egg products at a premium price. In general there are two main factors that shape consumer perception on non-caged egg products. First, the degree to which a consumer is aware of the ingredients of individual processed products, i.e. whether it is known that a certain product contains eggs or not. Second, the level of awareness of animal welfare that is present in the Member State or region in which the consumer is located. The industry believes that until consumers make the link between shell eggs and processed products containing egg, they are less likely to demand the same animal welfare attributes.

These factors aside, higher average income levels also tend to be associated with awareness of animal welfare issues and may thus increase demand for non-caged eggs. Depending on the level of consumer awareness, food manufacturers may segment their markets accordingly and only sell products containing non-caged eggs in one or more selected Member States. Food manufacturers also tend to primarily use non-caged eggs in products where the egg is either more visible, or where the consumer is generally well aware that egg is a major ingredient, for example in the case of mayonnaise. In this context, there seems to be little consumer concern at the present over the type of eggs used in processed products in much of the EU. To add to this, the food industry believes that there is a degree of confusion in some Member States about the different egg production systems in use and what they entail.

6. Trade in egg products

6.1. Import duties

In accordance with the requirements of Directive 2002/99/EC, the EU has drawn up a list of third countries from which EU Member States may import egg products for human consumption¹⁹. The import duties payable are set out in Table 6.1.

Table 6.1: Import duties on eggs and egg products

Nomenclature	Description	Specific customs duty per 100kg net in Euro	Notes
0407 0030	Shell eggs (including boiled eggs)	30.40	a, b, c, d, f, g, h
0408 9180	Whole egg dried	137.40	a, b, c, d, e, f, g
0408 9980	Whole egg other than dried; long egg	35.30	a, b, c, d, e, f, g
0408 1180	Egg yolk dried	142.30	a, b, c, d, e, f, g
0408 1981	Egg yolk liquid	62.00	a, b, c, d, e, f, g
0408 1989	Egg yolk frozen	66.30	a, b, c, d, e, f, g
3502 1190	Egg white dried	123.50	a, b, d, e, f, g
3502 1990	Egg white other than dried	16.70	a, b, d, e, f, g

Notes:

- (a) Products originating from OCT-countries (Overseas countries and territories) can be imported with 100% reduction of the customs duty.
- (b) Products originating from third countries can be imported with partially reduced customs duty within the GATT agreement for eggs.
- (c) Products originating from certain ACP countries (Africa, Caribbean and Pacific) can be imported with 16% reduction of the customs duty.
- (d) Products originating from certain countries (especially so called less developed countries) can be imported with 100% reduction or with a partially reduced customs duty under the arrangements set for the Generalised System of Preferences (GSP). A list of the countries concerned can be obtained from the Customs.
- (e) Products originating from Mexico can be imported with 50-100% reduction of the customs duty under the arrangements set for import quotas for eggs from Mexico.
- (f) Products originating from the Republics of Albania, Croatia, Bosnia and Herzegovina, Macedonia, Serbia or Kosovo can be imported with 100% reduction of the customs duty under the free market arrangements.
- (g) Products originating from South Africa can be imported with a (partially) reduced customs duty under the arrangements set by free market arrangements.
- (h) Products originating from Israel can be imported with 100% reduction of the customs duty under the arrangements set for import quotas from Israel.

Source: European Commission and EEPA.

¹⁹ This list of countries can be found in Annex II Part I of Commission Decision 2006/696/EC. Currently, 36 countries or parts thereof are included in this list.

6.2. Tariff Rate Quotas

Table 6.2 shows the preferential import quotas on eggs and egg products for marketing year 2007/08.

Table 6.2: Preferential import quotas on eggs and egg products, 2007/08*

Nomenclature	Description	Annual tariff quota (tonnes)	Customs duty applicable, Euro/tonne product weight
	Shell Egg	135,000	
0407 0030	Shell eggs (including boiled eggs)		152.00
	Whole Egg and Egg Yolk Products	7,000 (a)	
0408 9180	Whole egg dried		687.00
0408 9980	Whole egg other than dried; long egg		176.00
0408 1180	Egg yolk dried		711.00
0408 1981	Egg yolk liquid		310.00
0408 1989	Egg yolk frozen		331.00
	Egg White Products	15,500 (a)	
3502 1190	Egg white dried		617.00
3502 1990	Egg white other than dried		83.00

* Tariff quotas for 1 July 2007 to 30 June 2008, as laid down in Commission Regulation 539/2007.

Notes:

(a) Shell egg equivalent. Conversion according to the yield rate fixed in Annex 69 to Commission Regulation 2454/93.

Source: European Commission.

Tariff Rate Quotas (TRQ) are used for dried egg, but are not well utilised for shell eggs or frozen or liquid products. At the moment, therefore, the tariffs are providing a reasonable degree of protection. If there is a Doha Agreement the tariff rates will probably come down and the TRQ will probably reduce. The industry (and animal welfare organisations) are pushing for sensitive product status for eggs because there is a risk to the EU dried egg market. At the same time, EU egg production costs are likely to increase when traditional caged production ceases from January 2012. Moving to free range production systems could be a protective move as EU producers will be competing in a different market from the global commodity shell egg trade. However, if commodity dried egg costs are sufficiently lower than EU produced egg products, then food manufacturers might be induced to switch from liquid to dried egg products. That said, if food manufacturers are also trying to move to the use of non-caged egg products then this may serve as some protection for the EU egg products industry.

6.3. Trade in egg products

Table 6.3 and Table 6.4 present imports of liquid and dried egg products²⁰ from third countries into the EU between 2001 and 2006. Imports of dried egg products are far more significant than imports of liquid egg product as a result of lower transportation costs (less weight and no need to store chilled) and longer shelf life.

Table 6.3 shows that EU imports of liquid egg products increased substantially between 2004 and 2005. Part of this results from the apparent decline in imports between 2003 and 2004. However, this decline results in part from the accession of new Member States in May 2004²¹. Prior to accession trade between new Member States and the EU-15 would have been third country trade while following accession this trade became intra-EU trade and therefore no longer appears in the figures. At the same time, trade between a third country and, say, Poland in 2003 would not feature in the EU data for 2003, but would in 2004. In addition to this structural change, the industry explained that the increase in imports between 2004 and 2005 was at least partially attributable to the avian influenza crisis in the Netherlands in 2003 which reduced supply and raised prices for liquid egg products in the EU making imports more competitive. Industry sources also indicated that more shell eggs were imported from the US into the EU to be transformed into egg products at this time and for the same reasons. Industry sources also reported that the US was selling into the EU market at a discount at this time in order to bolster domestic price and this increased the competitiveness of US products.

Table 6.3: Imports of liquid and frozen egg products from third countries into the EU, 2001-2006 (in tonnes of egg product)

Country of origin	2001	2002	2003	2004	2005	2006
USA	3		1		382	320
India	17					
Thailand	16	32	60		20	10
China	57	14		32	40	
Japan		10				
Philippines			1			
Australia					36	36
Israel			27	2		
South Africa					1	
Switzerland	7					4
Estonia		20				
Hungary		22				
Poland			147			
Croatia				5		
Norway					314	645
Total	100	98	236	39	793	1,015

Source: ZMP based on IEC and EUROSTAT data.

²⁰ Both whole egg, egg yolk and egg white (albumen) products are included in the figures shown.

²¹ For simplicity data relating to the new Member States has been included from January 2004 in the Tables.

THE EU EGG PRODUCTION SECTOR

The main third country locations for egg drying are India, Mexico, China and South American countries, particularly Brazil and Argentina. The US has egg drying operations as well, but, similar to the EU, the US mainly exports its egg product surpluses. Thus, most US egg product production supplies the domestic market. In contrast, major exporting countries like India, Brazil and Argentina often specifically produce for export purposes. In India there are three egg product manufacturers who export all their (mainly dried) egg products. Similarly, a large proportion of the dried egg products produced in Brazil and Argentina are exported. Some questions have been raised by the EU egg products industry over third country quality in relation to drug residues in the past and this issue tends to reappear from time to time.

Table 6.4: Imports of dried egg products from third countries into the EU, 2001-2006 (in tonnes of egg product)

Country of origin	2001	2002	2003	2004	2005	2006
USA	124	220	451	390	427	1,380
Canada	153		25	92	214	213
India	755	1,044	1,694	2,744	3,135	3,807
Thailand						
China	277	105		34		4
Japan	9	69	82	15	6	68
Philippines			5			11
Hong Kong			1			
South Korea			1			
Australia	23					
Israel		22	325	161	20	183
Yemen			7			
Brazil	168	414	149	172	128	173
Argentina	62	48	222	1,052	1,627	1,714
Mexico	23	132	163		312	200
South Africa			4			12
Ghana					2	
Barbados	2					
Switzerland	4				2	3
Czech Republic	55	75	40			
Slovenia						
Estonia	4		2			
Lithuania		13				
Hungary		57	222			
Poland			80			
Bulgaria	20					70
Croatia			95	37	12	143
Ukraine	8			3		
Russia				15	20	
Norway	77	30		131	1	12
Total	1,764	2,229	3,568	4,846	5,906	7,993

Source: ZMP based on IEC and EUROSTAT data.

However, at least in the short-term, non-caged egg products would still have to be sourced from the EU as no third country produces significant quantities. There is very little use of alternative egg products in the US, but this market is likely to increase as animal welfare issues gain higher profile. The US cage-free system is similar to the EU barn system, but with less restrictive stocking densities. California is, however, considering banning cages for egg production, although there are fears amongst the US industry that this would simply shut down one of the largest US production bases. There is some legislation on caged production in Australia and some use of eggs from alternative systems. However, there is no demand for exports of alternative egg products from the EU to third countries at present.

Table 6.5 and Table 6.6 present EU external export figures for liquid and dried egg products.

Table 6.5: Exports of liquid and frozen egg products from the EU into third countries, 2001-2006 (in tonnes of egg product)

	2001	2002	2003	2004	2005	2006
EU-15	15,044	13,240	13,094	12,350	-	-
EU-25	-	-	-	12,624	12,583	11,573

Source: ZMP based on IEC and EUROSTAT data.

Table 6.6: Exports of dried egg products from the EU into third countries, 2001-2006 (in tonnes of egg product)

	2001	2002	2003	2004	2005	2006
EU-15	12,816	12,137	10,561	13,586	-	-
EU-25	-	-	-	13,970	12,475	12,961

Source: ZMP based on IEC and EUROSTAT data.

Around half of EU egg white production is exported to third countries, with the largest market being Japan followed by Russia, Ukraine, Taiwan and then other Asian countries.

According to the EU egg industry, a large amount of liquid egg products and even shell eggs are currently imported from the US. This applies in particular to egg yolk which is cheaper in the US, partly as a result of relatively higher demand for egg white. This is convenient because demand is higher in the EU for egg yolk as opposite to egg white. According to one interviewee in the EU egg industry, the EU exports some of its egg white to the US, although this is disputed by another commentator who stated that no EU processor has the necessary USDA approval. This respondent added that most of the egg white imported by the US is sourced from Canada.

6.4. Inward Processing Relief

Inward Processing is the term used to describe the duty relief procedure established under Council Regulation (EC) 2913/92. It allows imported raw materials or semi-manufactured goods to be imported into the EU for the purpose of being processed within the EU and subsequently re-exported to third countries within six months, without payment of duties and VAT on the raw

materials used. In this context, processing can be anything from repacking goods to highly complicated manufacturing. There are two variations of Inward Processing Relief (IPR):

- the so-called suspension system, under which import duties payable are suspended at importation; and,
- the so-called drawback system, where the import duties are paid at importation and reclaimed when the processed goods are exported.

When eggs are imported for processing from third countries into the EU, processors can make use of inward processing. Table 6.7 presents imports under IPR between 2000 and 2007.

Table 6.7: Total EU imports of eggs and egg products under IPR, 2000-07 (in tonnes of shell egg equivalent)

	2000	2001	2002	2003	2004	2005	2006	2007
Fresh eggs for consumption	7,687	2,878	3,079	4,289	796	306	1,532	4,607
Dried egg albumen	306	51	330	1129	257	171	265	1,172
Other egg albumen	44	0	0	0	16	52	178	549
Dried egg yolks	51	49	103	461	3,755	5,464	6,466	7,064
Otherwise preserved egg yolks	59	8	0	3	0	0	0	0
Dried eggs not in shell	909	1,904	1,832	1,434	1,940	2,500	5,983	4,617
Fresh or cooked eggs not in shell	8	0	0	0	0	231	63	0
TOTAL	9,063	4,890	5,345	7,316	6,763	8,725	14,487	18,009

Note: Total is EU-15 from 2000 to 2003, EU-25 from 2004 to 2007.

Source: European Commission.

6.5. Trade outlook

Third countries have a price advantage because of the egg production systems that they use and the labour costs (although these are not a major cost component). By and large the current tariff regime is sufficient to prevent significant imports, although the Ukraine has relatively easy logistical access to the EU shell egg market and egg production is cheap. This cost advantage would also apply if liquid egg products were coming in to the EU from the Ukraine. The EU egg products industry believes that there are likely to be egg processing units going up in the Ukraine, so there may be competition in the future.

Some 40% of total global laying hens are in China whilst the egg product industry accounts for only 2% of their total egg production (much of which is only currently possible with overseas investment) and this is seen as a major threat to the EU egg products industry in the future because of the significant production base.

On the positive side, the impact of higher oil prices on transport costs and the food miles issue should help EU egg producers maintain market share. These arguments are particularly likely to apply for high value products, but less so for the commodity market. Similarly, a major fast food

restaurant chain indicated that its competitors will probably switch from using caged to cage-free eggs and egg products in the future.

According to a major European food manufacturer, in the short to medium-term, imports of egg products based on eggs from caged hens are very likely to increase due to the EU-wide ban on battery cages from 2012. However, once the non-caged egg and egg product industry has matured in the EU, the situation on the EU market may reverse in that the use of non-caged eggs in products may become standard and caged eggs will only be used to a limited degree, perhaps where customers believe that there is some intrinsic advantage. As a result, the sourcing of egg products from third countries may reduce and eventually be limited as demand for caged eggs/egg products in the EU declines. This, however, would only be the case if products based on eggs from non-caged birds moved from being a high value product to a commodity market.

7. Conclusions

Approximately 1.5 million tonnes of egg products are produced annually in the EU. These utilise around 28%-30% of total domestic shell egg production and this market is growing by just over 1% annually. The EU egg processing sector is highly concentrated with just 9 companies accounting for more than 40% of total production. Seventy percent of total egg products are whole egg with the remaining 30% being separated, two-thirds of which is egg white and one-third yolk. Liquid products account for 80% of the market, dried products 19% and frozen products 1%.

Eighty percent of egg products are used for human consumption with the balance being used for technical applications. Of those used for human consumption, between 70% and 80% are used in the food processing industry with the balance used in the catering sector.

The market share of dried eggs is increasing at the expense of liquid and frozen products, essentially because dried egg has a longer shelf life and is easier and cheaper to transport and store. However, some members of the industry believe that liquid egg has some functional advantages over dried egg.

Eggs for processing are sourced mainly on price with second quality and distressed first quality eggs utilised before first quality eggs are sourced. This first use of what are waste products in the shell egg market helps to minimise the cost of egg products. Egg products are sourced according to a number of criteria, principally security of supply, although price is also very important.

Whilst there is a market for egg products from non-caged eggs, this is limited to a few countries in the north and west of the EU, principally the UK (the largest market), Ireland, Austria, Germany, Sweden and the Netherlands. In total the market for non-caged egg products amounts to between 2% and 5% of the egg product market. In the UK the proportion of liquid egg that is made from non-caged eggs (mainly free range) is as high as 15% and is likely to increase further as Hellmann's mayonnaise is reformulated to use free range eggs from March 2008.

There are price implications arising from the use of non-caged eggs. This is for two reasons. First a switch to non-caged eggs generally implies a switch from a mix of second quality, distressed and first quality eggs to first quality eggs. Second, non-caged egg production systems are higher cost (and typically smaller scale) than caged egg production systems. Non-caged liquid egg is currently around 50% more expensive than caged liquid egg. The extent to which this adds cost to final products depends on the proportion of egg used. Some companies may opt recoup this cost through higher prices, others may consider that the use of non-caged egg product is important to their brand identity and may be less inclined to seek to cover the additional cost.

THE EU EGG PRODUCTION SECTOR

The EU market for egg products is currently protected to some extent from third country imports by the import tariff regime and the cost of transport. However, there is a risk that agreement on the Doha round of WTO negotiations and the banning of traditional battery cage egg production in the EU from January 2012 will reduce protection and raise costs making the EU egg products sector more vulnerable to imports from countries such as India, Brazil, Argentina, Ukraine and eventually China.

However, if the use of egg products from non-caged eggs becomes the norm in the EU then some measure of protection will be afforded to the sector. It is therefore recommended that EuroGroup for Animals seeks to work with the egg product and associated industries to promote the use of non-cage egg products within the EU.