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# Agricultural Economic Report

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#### ABSTRACT

AGRICULTURAL ECONOMIC REPORT 2003 OF THE NETHERLANDS: SUMMARY

P. Berkhout & C. van Bruchem (eds.)

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This report offers an English summary of the *Landbouw-Economisch Bericht 2003*. It presents a survey of the economic state of Dutch agriculture and horticulture. First, attention is paid to general economic and political developments and to the development of the agricultural complex. Next, the report deals with the rural area and with environmental issues. Following a description of the production structure and production factors in agriculture, profitability and income formation in the various subsectors are analysed.

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## Preface

This summary of the *Landbouw-Economisch Bericht 2003* offers a global survey of the economic and financial state of Dutch agriculture and horticulture. In it, the changing economic and political circumstances affecting the sector are explicitly taken into account. The complete report, which is available only in Dutch, is based on data and contributions from the three research departments of the Institute. The report has been coordinated and edited by the Public Issues Department. The final draft of the 2003 edition of the report was completed in May 2003.

The Hague, July 2003

A handwritten signature in blue ink, appearing to read 'L.C. Zachariasse', is written over a faint, larger version of the same signature.

The Director,  
Prof. L.C. Zachariasse

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# Economic and Political Framework

## 1.1 General Situation

In the past year the expected recovery of economic growth remained well behind expectations. In the OECD countries, the economic growth was a mere 1.4%, in developing countries 2.8%. However, major differences exist between regions. A number of countries, like those in East and Central Europe, realised growth rates of more than 3%. The same goes for countries in East Asia. Projections of economic growth for 2003 are low as well due to the uncertainties on international financial markets and lack of consumer trust.

The euro appreciated in the second half of 2002, after a relatively weak start. The recovery was mainly due to the weakness of the American dollar. In January 2003 the value of the euro to the dollar was around 1.08. Inflation in the European Union was higher than the 2% permitted according to the guidelines of the European Central Bank. The increasing strength of the euro will temper the risk of higher inflation rates. Economic growth for the EU for 2003 is projected at 1.9%, rising to 2.7% for 2004.

In the autumn of 2002 the European Union reached a new milestone with the conclusion of the negotiations for the accession of ten new member states. On 1 May 2004 Estonia, Latvia, Lithuania, Poland, Slovenia, Hungary, the Czech Republic, Slovakia, Cyprus and Malta will join the Union. The Union also agreed to financially support further reforms in Bulgaria and Romania with the aim to let these countries join the Union by the year 2007. The Convention for the future of Europe, installed to give recommendations for the decision-making structure in the enlarged European Union, has been less successful. Although the first proposals for a European constitution have been presented, no agreement has been reached yet. The diversity of opinions between the participants remains quite large, especially on subjects like who should preside over the Union.

Partly under the influence of the developments in the world economy, the growth of the Dutch economy in 2002 declined to only 0.3%. The inflation was 3.3%. For 2003 a recovery of economic growth is not expected. In line with the low economic growth, the level of unemployment rose to 4.3%.

In the spring of 2003 there was an outbreak of the highly contagious Avian Influenza in the Netherlands. On several hundred farms livestock had to be destroyed; in total more than 25 million chickens and other poultry animals were killed, including those kept as pets or as a hobby, to prevent further spreading of the disease. The economic damage is estimated at at least 200 million euro, which includes the costs for culling of susceptible animals and aid for farmers of infected farms. Halfway May it looks like the spreading of the disease has been effectively stopped. As with the Foot and Mouth disease outbreak in 2001 and the Swine Fever in 1997, this event will probably fuel the discussion about the future of intensive livestock production in the Netherlands.

In May 2002 elections led to fundamental changes in the political arena. However, the new government had to step down after only four months. In January 2003 new elections more or less restored the old political constellation. Halfway May 2003 the new government presented an outline of her plans. Due to this situation in many policy areas a stand-still occurred the past year.



## 1.2 Agriculture in the World

In the period 1998-2000 the number of undernourished people in the world was 840 million according to the latest estimates. The majority – 799 million people – lives in developing countries. The actual decrease of the number of undernourished people is only 2.5 million a year; at this rate it will be almost impossible to reach the goals set in the Food Summit Declaration of 1996, except for certain regions like Latin America and East Asia.

The relatively steep growth of the population in various parts of the world puts extra pressure on the possibility to drive back the hunger. The Food and Agricultural Organisation expects it will be possible in the coming years – on a global level – to feed the world. However, on a local level there will be large differences. Especially developing countries will become more dependant on the import of food, as their local resources will be insufficient to feed their growing population. Especially the availability of sufficient water continues to be an obstacle for the necessary growth of food production.

World agricultural production in 2002 slightly increased compared to 2001. Per capita production fell with nearly 1%. Cereals production dropped with over 3%, due to drought in three important production areas (Australia, the United States, Canada). Other crops like pulses and oilseeds showed less change in production. The production of livestock products increased slightly. The world market prices for agricultural products show the reverse picture. For crops prices were generally speaking good, for livestock products prices were under pressure.

The international trade in agricultural products increasingly takes place within regions. The most important regions are Western Europe, North America and Asia. The share of these regions in world agricultural trade is 30, 10 and 5% respectively. Table 1 shows the development of import and export to and from various regions in the period 1990 – 2001. The figures on the diagonal show that intra-regional trade has slowly gained importance in the last decade. The picture for the development of trade between regions is more diverse.

The trend of declining support of governments for agricultural production has been prolonged in 2002. Total support for agriculture, as a percentage of gross domestic production, is now 1.2%, slightly less than in 2001 and half the percentage in the period 1986-1988. The producer subsidy equivalent (PSE) was estimated at 31% in the OECD-countries in 2002, similar as in 2001 and clearly less than in 1986-1988 when the PSE was estimated at around 38%. The support per product remains highly differentiated, with products such as eggs, wool and poultry meat receiving little support and products such as rice, milk, beef and sugar receiving a lot of support.

The WTO trade talks, otherwise known as the Doha development round, have come to a temporary halt due to non-agreement on several dossiers. In the area of medicines and the special position of developing countries important deadlines were missed in December 2002. Regarding agriculture, the 31 March 2003 deadline, by which date the 'modalities' for the agricultural paragraph should have been agreed upon, was not met either. The modalities are the targets for achieving the objectives of the negotiations, as well as issues related to rules. The modalities will set the (technical) parameters for the final agreement in the agricultural negotiations. The chairman of the agricultural negotiating group, mister Harbinson, put forward two compromise papers. Neither was acceptable to any of the participating countries.

**Table 1.1** Growth (%) of agricultural exports to and from different regions, 1990 - 2001

Destination	Western Europe	Asia and Oceania	North America	East and Central Europe	Africa	Middle East	Latin America	Total
<b>Origin</b>								
Western Europe	2	4	3	6	0	-1	1	<b>2</b>
Asia and Oceania	1	4	5	-5	4	2	3	<b>3</b>
North America	-2	1	6	-7	1	0	7	<b>2</b>
East and Central Europe	2	8	6	..	5	12	-8	..
Africa	1	4	1	1	3	12	11	<b>2</b>
Middle East	-2	7	..	..	..	12	..	<b>5</b>
Latin America	3	8	5	-8	7	8	8	<b>4</b>
<b>Total</b>								<b>3</b>

Source: WTO.

### 1.3 Agriculture in the European Union

In January 2003 the European Commission has presented proposals for a reform of the Common Agricultural Policy (CAP). According to the Commission these proposals will make European agriculture more competitive and market oriented, will promote a substantial simplification in the CAP, will facilitate the enlargement process and help to better defend the CAP in the WTO. The core of the reform proposals is decoupling: support should no longer be linked to area or animals. The current support payments should be transformed into a single farm payment, independent from production. These single farm payments should be given on the condition that certain standards in the area of the environment, food safety, animal welfare, health and occupational safety are met, as well as the requirement to keep all farmland in good condition ('cross-compliance'). The single farm payments will be reduced over the years for bigger farms ('degression') to generate additional money for rural development and savings to finance further reforms. Larger farms, in terms of the support amount received, will face higher degression rates than smaller farms, the so-called modulation of support. Besides the single farm payment a number of revisions to the market policy of the CAP has been proposed, like a final 5% intervention price cut for cereals and higher direct payments for cereal farmers, maintenance of the milk quotas until 2014/2015 but acceleration of the price cuts for butter and skimmed milk powder. Finally, the Commission proposes to strengthen the second pillar of the CAP, the rural development policy, by adding three new measures to the existing support measures: to promote quality, animal welfare and to help farmers to meet EU production standards. Through the principle of degression of the direct payments, more money will become available as well.

The (revised) CAP will also be applicable in the candidate-countries. From 1 May 2004 all market measures – like intervention and export subsidies – will be applied. The direct payments will be gradually phased in over ten years time, starting at 25% of the amounts given to farmers in the

EU-15. Production quotas for the candidate countries will be based on recent reference periods for which data are available. Current levels of production are far below the production capacity (see also table 1.2). It is not expected that the candidate countries will return to their 'old' levels of production in the short run, however, in the long run this could well be the case.

**Table 1.2 Production and production capacity candidate countries, 1990-2002**

	CEEC-10 a)				CEEC-8 b)			
	1990	1995 -2000	2001	2002	1990	1995 -2000	2001	2002
<b>Area (mio. ha)</b>								
Cereals	23.7	23.9	24.5	23.9	15.9	15.9	16.1	15.9
Oilseeds	2.2	3.0	2.9	3.1	1.6	1.9	1.5	1.6
<b>Number of animals (in mio.)</b>								
Cattle, total	27.4	16.0	13.7	13.7	21.4	12.1	10.3	10.2
Dairy cows	11.4	8.0	7.2	7.1	9.0	6.0	5.2	5.1
Sheep	29.1	13.6	11.5	11.4	7.0	2.1	2.0	1.9
<b>Production (mio. tons)</b>								
Milk	38.0	28.0	28.0	27.7	32.5	21.9	21.5	21.2

a) CEEC-10 includes the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia, Slovenia, Bulgaria, Romania;

b) CEEC-8, idem but excluding Bulgaria and Romania.

Source: Eurostat.

In 2001, the volume of production in the EU 15 slightly increased by 1%, prices decreased by 3% on average. In the crop sector prices on average diminished by 2%. However the livestock sector was faced with a 5% price decrease on average, due to considerable price changes for pigs (-18%), poultry (-8%) and milk (-5%). The value of the means of production purchased slightly decreased (-2%). The net added value of the sector dropped by 6%. Taking into account the inflation and the decrease in the number of workers by around 3%, the income drop was on average 4%. In the northern member states incomes in general fell more substantially than in the southern states. Farmers in Denmark and Germany faced the largest income decrease.

## Developments in the Dutch Agricultural Sector

### 2.1 Consumption and sales structure of food

Consumer spending on food in the Netherlands increased by 5% in 2002 as a result of higher prices. The share of food expenditure in total expenditure on consumption remained almost the same (11.3%). The share of expenditure on organic food in total food expenditure is still small, on average 1.6%. Market shares for individual products are higher, for instance for potatoes, vegetables and fruit (3.6%), meat (1.7%) and fresh dairy products (1.9%). The sale of organic products grew by 9% in 2002, partly due to several media campaigns of the government to promote organic products. Most organic products are sold through supermarkets that have increased the supply of organic products. For non-organic products the role of the supermarket in the sale of foods is becoming progressively more important as well, at the expense of speciality shops. In 2002 the supermarkets' share in the total sales had increased to around 70%.

A new phenomenon in the Netherlands is the mega supermarket with a floor area ten times as big (3,000 to 4,000 m<sup>2</sup>) as the more common supermarkets. Discounters, supermarkets with low prices and a limited number of products, have become more popular as well. Their market share grew to 8.3% in 2002. The largest Dutch retailer, Albert Heijn, is faced with major financial troubles due to among other things accounting irregularities of the American daughter US Foodservice.

Within the Dutch retail sector the concentration process continues. The same goes for the processing industry and suppliers for the agricultural sector (of for instance fertilizers, plant protection products and seed). Two dairy companies process 80% of all fresh milk, two slaughterhouses slaughter 75% of all pigs and four retailers have a market share of over 85%. Recent research by the LEI however shows no strong indications that this concentration process leads to a misuse of (market) power by the firms.

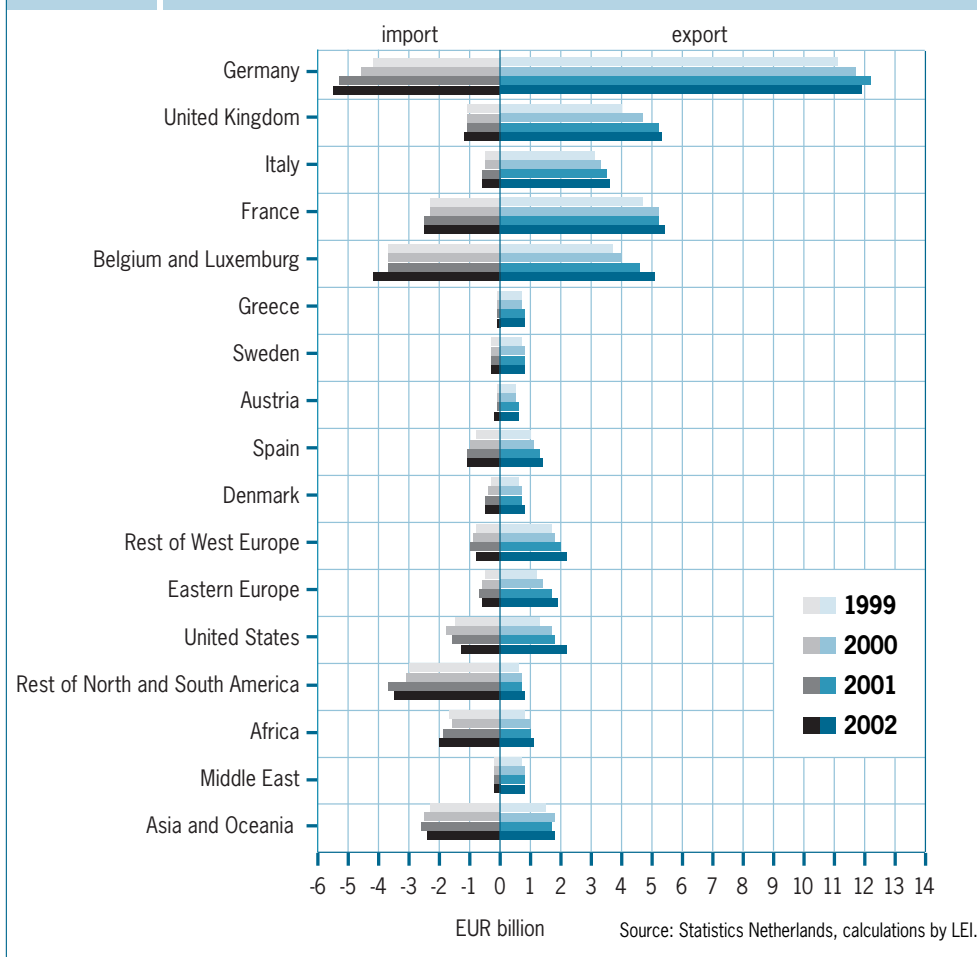
There is growing attention for food safety by both government and consumers, although Dutch consumers seem to worry less about food safety than their fellow Europeans. Most worries relate to the consumption of poultry and eggs and to genetically modified products.

### 2.2 Agricultural Imports and Exports

The Dutch export of agricultural products and foods grew in 2002 by 3.5%, whereas import fell by 0.5%. The surplus on the agricultural trade balance grew to around 20 billion euros. Ornamental crop products make the greatest contribution to the agricultural export, followed by meat and dairy products. The Netherlands is also a major importer of meat and dairy products. Most product groups show a growth in export; the export of meat is slowly recovering from the set back due to the occurrence of BSE and the outbreak of foot-and mouth disease.

The Dutch agricultural export is still largely focused on the EU partner states. In 2002 nearly 75% of agricultural exports was sold on the internal market. Germany was, as always, the most important destination although its share decreased compared to 2001 (figure 2.1). Import prices and export prices for agricultural products were on average comparable to the previous year, with the exception of meat, dairy and eggs. Prices for these products were considerably lower, for both import and export.

**Figure 2.1** Origin and destination of Dutch agricultural trade, 1999-2002



## 2.3 The Agricultural Complex

The gross value added of the Dutch agricultural complex has risen from around 32 billion euros in 1995 to almost 39 billion in 2001. However, the share of the agricultural complex in the national total has decreased in this period, just as the share in employment, to just above 10% (table 3). The share of the primary sector (the sum of agriculture and horticulture) in the gross value added has decreased over this period by around 5%.

The dependency of the the Dutch agricultural complex on export is still rising, in 2001 about 70% of the gross value added and of employment was related to export activities.

The grassland based livestock complex contributes most to the value added of the agricultural complex. The share of this sector in the total complex is however decreasing, while that of the greenhouse gardening complex is increasing.

Table 2.1	Gross value added and employment of the Dutch agricultural complex, 1995 and 2001			
	Gross value added (EUR billion)		Employment (1,000)	
	1995	2001(est)	1995	2001(est)
<b>Agricultural complex<sup>a)</sup></b>	32.3	39.3	659	670
<i>Share in national total</i>	12.0%	10.4%	11.6%	10.2%
Gardening, agricultural services and forestry	1.3	2.0	32	39
Processing, supply and distribution of foreign agricultural raw materials	10.9	14.6	197	217
<b>Agricultural complex (based on domestic agricultural raw materials)</b>	20.2	22.7	430	413
<i>Share in national total</i>	7.5%	6.0%	7.6%	6.3%
Agriculture and horticulture	8.4	8.3	189	181
Processing industry	3.0	4.1	54	50
Input manufacturing	6.5	7.3	135	128
Distribution	2.3	2.9	53	55
a) Based on domestic and foreign agricultural raw materials (including gardening, agricultural services, forestry, cocoa, alcohol and tobacco).				Source: LEI.

## Agriculture, Rural Areas and the Environment

### 3.1 Nature Conservation and the Countryside

The total land area of the Netherlands amounts to 3.4 million hectares, of which some 69% is used for agriculture and horticulture, 17% for woodlands, nature reserves and recreation ('green activities') and 14% for housing, business activities, and infrastructure ('red activities'). In the past 50 years there have been little changes in the use of the total land area.

The actual price of agricultural land decreased by around 5% in 2002, which is in contrast with the sharp price increases of the past few years. The decrease is due to the drop in agricultural income and to the diminishing non-agricultural demand. The governing parties in 2002 chose to give preference to nature conservation by farmers and other private landowners over nature conservation by public organisations. This will lead to a halving of the intended purchases of land by the government to 2,500 ha per year. This policy will most probably be pursued under the current government.

Currently, around 11,000 farms are active in nature conservation on a total area of around 90,000 ha. The aim of the government is to have 135,000 ha under nature conservation by farmers, so around two thirds of the goal has been reached.

The results of the farmers exploiting woodland were on average negative for the year 2001. The income on these farms consists for about fifty percent of government subsidies. Income from market activities like the selling of wood forms the other half.

#### Rural amenities

Nature conservation by farmers is one of the so called 'rural amenities', by which term activities like management of nature and landscape as well as water conservation by farmers are meant. Speaking in more general terms, rural amenities are activities employed by a farmer to 'create' a public good. Although demand of society for rural amenities seems to be high as well as the willingness of farmers to deliver these amenities, in practice it turns out to be quite difficult to bring supply and demand in line with each other. One of the reasons is that the market seems to fail in this respect, a phenomenon not uncommon for public goods. Another reason is the complexity to adequately remunerate the services provided by the farmers, partly caused by the difficulties to clearly describe the services.

The contribution of the creation of these public goods to the farmers income is currently estimated at less than 1% and mainly comes from nature and landscape management. In future this might change if some of the described obstacles are overcome. However, the contribution will always remain fairly limited because for the delivery of these amenities especially the production factor land is used and the activities require little labour. For rural amenities with a more private character, like agro tourism, the income potential is higher. However, these kind of activities also require more investments by the farmers.

### Restructuring of agriculture

Several initiatives for reconstruction of parts of the agricultural sector suffer from delay due to budgetary constraints. For land consolidation projects, the buying of land for non-agricultural purposes is an import element. Due to the above described halving of the intended purchases a number of projects will most probably take longer than originally expected.

The Reconstructiewet Concentratiegebieden (Dutch law on reconstruction for concentration regions) set up on 1 April 2002 offers a framework for the restructuring of intensive livestock farming in areas with a lot of pigs and poultry. Within the concentration regions there will be zones in which these branches can expand ('development zones'), zones in which intensive livestock farming must be combined with other functions ('interwoven zones') and zones where this sector must be driven back, among other things by transfers of farms ('expansion zones'). The implementation of the Reconstructiewet is delayed due to lack of money.

For horticulture under glass it is the intention to establish a number of project locations with the aim to concentrate production. The government financially supports the development of these locations. The original idea was to develop 10 locations but parties in one province could not agree about the exact location. Currently 9 locations are in different stages of development. On a number of locations horticultural holdings have started, for other locations the plans are currently drawn or a decision about the exact location is still pending.

## 3.2 Environmental Issues

The pressure on the environment from agriculture and horticulture is clearly decreasing, although not all goals have been reached yet. The reduction of pressure on the environment goes hand in hand with steadily rising costs: between 1990 and 2000 the costs associated with environmental policy for the agricultural sector have risen from around 100 million euros to around 530 million euros. The declining production volume over the last decade is another noticeable side effect: the last ten years agricultural production in the Netherlands grew by just 10% compared to 40% in earlier decades.

### Crop protection

Since the mid 1980s the use of pesticides has halved, in line with the goals outlined in the governments Long-term Plan for Crop Protection. A slight increase in use of chemical substances in 2002 should not be regarded as a reversal of the downward trend as the use in 2001 was extremely low due to favourable weather conditions. In 2002 in total 9.65 mio. kg of active substance was used in Dutch agriculture, herbicides accounting for about one third of this amount and fungicides for around 40%.

The Dutch government has been more restrictive in the number of approved chemicals than the European Union. This had led to a competitive disadvantage for the Dutch agricultural sector and was subject to much criticism by the sector. To ease this problem arrangements have been made to again allow the use of certain chemicals - which were forbidden in the Netherlands but still allowed elsewhere in the European Union - under specific conditions and for certain crops.



### Greenhouse gasses

The emission of greenhouse gasses from the agricultural sector has been steadily decreasing over the past years (table 3.1). The share of the emission of the agricultural sector is around 10% of the national total and was 12% lower in 2001 compared to 1990. According to the Kyoto protocol, the Netherlands should reduce the emissions by 6% in the period 2008-2012, so it is fair to say that the agricultural sector has delivered its share. In other sectors of the economy emissions have increased over the past years.

Around two thirds of the emission of the primary sector comprises methane and nitrous oxide, both of which are almost entirely for the livestock farmer's account. The downward trend of total greenhouse emissions can for the larger part be attributed to the declining number of animals in the Netherlands (see also table 4.1, chapter 4).

The remaining part of the emission is mostly carbon dioxide which is strongly related to the horticultural sector. The reduction of carbon dioxide is largely attributable to increased energy-efficiency (the amount of energy used per unit of product produced) in the glasshouse horticulture sector. The sector exerts much effort, particularly in the form of investments, in order to reduce the amount of energy per unit of product. Since 1980 the energy-efficiency improved by 48%. Part of the investment in improving the energy-efficiency has been undone by the further intensification of production. For 2010 the goal is to improve the energy-efficiency by 65%.

Table 3.1

#### Emission of greenhouse gasses (in billions kg. CO<sub>2</sub>-equivalents) from the agricultural sector, 1980 – 2001

	1980	1985	1990	1995	1999	2000	2001(est)
Emission of carbon oxide (CO <sub>2</sub> ) <sup>a)</sup>	7.2	5.6	8.4	8.1	7.1	7.1	7.0
Emission of methane (CH <sub>4</sub> )	10.8	11.1	10.7	10.1	9.0	8.7	8.7
Emission nitrous oxide (N <sub>2</sub> O)	6.9	7.3	6.9	8.3	7.8	7.2	7.2
<b>Total</b>	<b>24.9</b>	<b>24.0</b>	<b>26.0</b>	<b>26.5</b>	<b>23.9</b>	<b>23.0</b>	<b>22.9</b>

a) Only emissions generated within the agricultural sector; not corrected for fluctuations in temperature; excluding emissions of mobile sources like tractors.

Source: RIVM/Statistics Netherlands, several years.

### Mineral losses and ammonia emission

The mineral surplus in Dutch agriculture has decreased steadily in the past years (table 3.2).

The slight increase in 2001 should most probably be regarded as incidental. The manure surplus has almost disappeared if the current standards for the maximum permitted losses per hectare are applied. The core question is, however, if these standards, especially the standard for phosphate, are sufficient to reach a sustainable situation in the long term. If the standards for maximum permitted losses per hectare will be further sharpened, it cannot be excluded that a manure surplus will again develop.

The efficiency in use of minerals has greatly improved over the past years, as for instance shows from the diminishing use of fertilizer (table 3.2). Based on practical experience it is expected that efficiency in mineral use can further increase.

**Table 3.2** Balance of nitrate and phosphate on agricultural land in the Netherlands, 1970-2001

	1970	1980	1986	1990	1995	1998	1999	2000	2001(est)
<b>(kg N/ha)</b>									
<b>Input</b>	<b>332</b>	<b>447</b>	<b>508</b>	<b>459</b>	<b>472</b>	<b>443</b>	<b>435</b>	<b>394</b>	<b>393</b>
- Manure	133	190	241	239	252	224	226	205	<b>204</b>
- Fertilizer	185	240	249	201	201	199	190	169	<b>169</b>
Output	167	210	243	248	228	212	212	212	<b>198</b>
Difference	165	237	265	211	244	223	223	182	<b>194</b>
<b>(kg P<sub>2</sub>O<sub>5</sub>/ha)</b>									
<b>Input</b>	<b>135</b>	<b>160</b>	<b>176</b>	<b>153</b>	<b>137</b>	<b>133</b>	<b>135</b>	<b>131</b>	<b>130</b>
- Manure	80	115	128	108	101	92	97	94	<b>92</b>
- Fertilizer	50	39	41	37	32	36	33	32	<b>32</b>
Output	50	66	73	71	64	64	65	68	<b>62</b>
Difference	85	94	103	82	73	69	70	63	<b>68</b>

Source: Statistics Netherlands; RIVM.

Currently a number of elements of the Dutch manure policy are being discussed or in the process of being revised. For instance the Mineral Account System (Minas) has been relaxed on certain points, based on difficulties encountered in practice with the application of the system. This relaxation should not be confused with a relaxation of the underlying goals.

The emission of ammonia from Dutch livestock decreased from 293 mio. kg in 1985 to 134 mio. kg in 2001. This reduction is also largely due to the reduction of the number of animals in the Netherlands. Strict rules for the application of manure also contributed to this positive result. By 2010 emission should have been reduced to around 115 mio. kg, according to EU agreements. This should be an easy attainable goal; for the much stricter national objective, it might be more difficult to realise the planned reduction.

The ammonia policy in the Netherlands consists of two parts: generic rules, for instance for the application of manure, and 'zoning' rules. These last rules are drawn up to protect vulnerable nature areas. Within 250 meters of a vulnerable area, no increase in ammonia emission is allowed. This effectively prohibits the extension of existing holdings in the vicinity of these areas or the establishment of a new holding.

### Desiccation

Around half the nature area in the Netherlands suffers from desiccation. This problem is largely caused by intensified drainage of (farm)land and steadily increasing extraction of groundwater. The governments objective was to reduce the desiccated area by 25% in 2000, however this goal has by no means been reached despite large efforts. On the contrary, it is expected that the problem will only further increase the coming years. Measures to combat the desiccation often lead to rising groundwater levels or to a restriction on the use of water for sprinkling; both can lead to less optimal production conditions for farmers. On the other hand, storage of water can also be seen as a rural amenity (see previous section) for which the agricultural sector could be rewarded. This might offer the sector new income possibilities.

## Structure of Agriculture and Horticulture

### 4.1 Production Capacity and Farm Structure

The production capacity of Dutch agriculture and horticulture, measured in Dutch size units (DSU, see Appendix), decreased on average by 1.6%, considerably more than in previous years when the decrease fluctuated around 0.3%. This decrease in production capacity is largely the result of a diminishing number of milk cows and a substantial reduction in the number of pigs (table 4.1). The milk quotas and national arrangements to buy up pigs are the main causes for this decreasing number of livestock. Outdoor horticulture is the only sector showing an increase in production capacity over the past year, due mainly to an increase in the area of vegetables, flowers and tree cultivation. The growth was 6.4%, a sharp contrast with the decrease of 5.2% for the intensive livestock sector and 3.2% for the grassland based farms.

The number of farms also dropped, namely by 3.5%, which is less than the rate in previous years (table 4.2) and comparable to the percentage change at the end of the nineties.

The number of dairy farms has been steadily decreasing over the past years. The percentages by which horticultural holdings and mushroom growing farms decrease in number is back at the level of the end of the nineties, after a short period of acceleration. The number of intensive livestock farms showed a steep decline these past years, mainly as a result of low incomes. The outbreak of Avian Influenza is likely to have a considerable impact on the number of poultry farms and the production capacity in this sector.

**Table 4.1** Number of animals in the agricultural sector, 1990-2002

	Index (1990=100)				Number of animals (x1,000)
	1995	2000	2001	2002	2002
Dairy cows and calves	91	80	82	<b>79</b>	<b>1,486</b>
Cattle for grazing	96	62	61	<b>55</b>	<b>392</b>
Fattening calves	111	130	118	<b>119</b>	<b>713</b>
Sheep	98	77	76	<b>70</b>	<b>1,186</b>
Goats	125	294	364	<b>419</b>	<b>255</b>
Breeding pigs <sup>a)</sup>	99	89	83	<b>77</b>	<b>1,312</b>
Fattening pigs	101	93	89	<b>80</b>	<b>5,591</b>
Laying hens	86	99	96	<b>88</b>	<b>38,889</b>
Broilers	106	124	122	<b>133</b>	<b>54,660</b>

a) Piglets excluded.

Source: Statistics Netherlands, calculations by LEI.

**Table 4.2**      **Number of holdings by type of farm, 1994-2002**

	Changes in % per year					Number of holdings
	1994-96	1996-98	1998-00	2000-01	2001-02	2002
<b>All farms</b>	<b>-2.4</b>	<b>-2.7</b>	<b>-3.5</b>	<b>-4.8</b>	<b>-3.5</b>	<b>89,580</b>
Glasshouse horticulture and mushroom growing	-3.3	-3.6	-4.2	-7.2	-4.6	<b>7,515</b>
Outdoor horticulture	-2.8	-1.9	-3.7	-6.2	-2.9	<b>9,404</b>
Arable farms	0.2	-1.4	-1.9	-5.1	-2.1	<b>12,635</b>
Dairy farms	-3.2	-3.4	-4.6	-4.2	-6.1	<b>23,997</b>
Other grassland based farms	-1.4	-3.2	0.9	1.5	-1.1	<b>19,260</b>
Intensive livestock farms	-3.1	-2.1	-6.1	-9.5	-5.6	<b>8,317</b>
Mixed farms	-3.3	-1.7	-6.7	-10.7	-0.4	<b>8,452</b>

Source: Statistics Netherlands; calculations by LEI.

The average size of farms is still gradually growing. In the period 1994 – 2002 the average area of all agricultural holdings in the Netherlands grew by 5 ha to 22 ha. The average size measured in Dutch Size Units (DSU) (see Appendix) grew by 21 DSU to 85 DSU. In 1994 18% of all farms had a size over 100 DSU. In 2002 this figure had increased to 28%. These large farms have a share in production capacity of around two thirds; their share in the use of land is around half.

### Organic farming

In 2002 the number of organic farms increased by 3.5% compared to 8% in the previous year (table 4.3), so the growth percentage was remarkably lower. The share of organic farms in the total number of farms in the Netherlands is now 1.7%. The growth in area used for organic production was about 12%, bringing the total area in the Netherlands used for organic production at 2.2%. Three quarters of this area are used for grassland and livestock forage crops.

The average size of organic farms increased from 25 ha in 2001 to 27 ha in 2002, so the average organic farm is slightly bigger the average non-organic farm. The differences between the various sectors are however large. On average, organic dairy farms have a larger surface than the 'regular' dairy farms as these farms produce their own feed. In the arable sector the organic farms are usually smaller in terms of area than the non-organic farms.

The aim of the government is to have 10% of the Dutch agricultural area in use for organic production by 2010. At the current growth rates it hardly seems likely that this objective can be realised. One of the obstacles for a higher growth in area seems to be lagging consumer demand. The consumers consider the price of organic products to be too high. On the production side obstacles are the lack of (seasonal) labour and the drop in income during the two-year conversion period, in which the farmer is not allowed to sell his products as organic.

**Table 4.3**      **Organic farming, 1999-2002**

	1999	2000	2001	2002
Number of farms	1,216	1,391	1,507	<b>1,560</b>
of which in conversion	280	270	305	<b>327</b>
Area (1,000 ha)	27.0	33.0	38.0	<b>42.6</b>
Share in total agricultural area (%)	1.4	1.7	2.0	<b>2.2</b>

Source: Biologica (2003); Statistics Netherlands.

### Producer organisations

Since the early 1990s a considerable growth in the number of producer organisations in the Dutch agricultural and horticultural sector has occurred. Farmers have set up these producer organisations to support the production of new products, both goods and services. The producer organisations can be seen as a response to changes in market conditions, as well as to changes in society.

The increasing scale of operation in other parts of the agrifood chain confronts primary producers with less bargaining power. A producer organisation offers the advantage of increased countervailing power towards for instance the processing industry or the retail businesses. A producer organisation can also offer the advantage of collective development and marketing of a new product, for instance a new tomato variety. Individual farms usually lack the means to undertake such activities. In the horticultural sector currently 74 producer organisations are active, representing around 2,400 members.

The need to cooperate is also very relevant in the area of nature management. To preserve the nature values in a certain area it is almost vital that farmers work together. Currently there are more than 100 nature societies, with on average 100 members. These societies are not only responsible for the management of nature and landscape in a certain area, they also improve the exchange of knowledge between farmers about nature conservation practices.

## 4.2 Labour, Land and Capital

Agriculture and horticulture offered employment to 258,000 people in the Netherlands in 2002, a decrease by 8% since the year 2000. Until 2000 the loss of employment for family labour was compensated by the increase in non-family labour. Since 2000 the non-family labour declined as well. About 69% of the labour force on farms is family labour.

Measured in agricultural work units (full time equivalents), the total labour volume diminished by 10% in the period 1994-2002. The number of family work units decreased by 25%, the number of non-family work units grew by 25%. Non-family labour currently has a share of 36% in the total number of jobs in the agricultural sector, compared to 26% in 1994.

The area of cultivated land in the Netherlands has been decreasing steadily over the past years. In 2002 the area remained more or less the same. The price of agricultural land decreased by 5%, due to lower agricultural incomes and less demand for land for non-agricultural purposes (see also paragraph 3.1).

The average balance total of all businesses in the Dutch agricultural and horticultural sector amounted to 1.1 million euros in 2000; nearly 70% is own capital, an indication of the good financial position of most holdings. This solvency percentage has decreased slightly over the past years, especially due to the growing need for capital when the holdings are expanded. To this end farmers take over assets (land, quota) from farmers who discontinue or downsize their business. The assets taken over were often financed with own capital but the expansion of the holdings is financed through loans. The current decrease of land prices could put further pressure on the solvency percentage. The same goes for the ongoing growth of the average farm size and the corresponding need for capital to finance this expansion.

The average family farm income in all agricultural and horticultural holdings in 2002 is estimated at 26,000 euro. This is a steep drop from last year's estimate of 38,000 euro. Income from outside the farm, which has become more important in the past years, is estimated at 14,000 euro. Total family income therefore adds up to 40,000 euro. On some farms this total family income is divided over more families: on average 1.15 families live on every farm. This leads to an estimated family income of 35,000 euro. The percentage of families with an income below the low income line, which is set at around 20,000 euro, has risen to 35% in 2002. In 2000 and 2001 this percentage lay around 25. In the period 1996-2000 on average 9,000 euro per holding could be saved. Higher (family) expenses in 2002 have led to negative savings of 4,000 euro per holding. It is the first time in years that on average on all holdings in the agricultural and horticultural sector negative savings occurred.

## Market and Income Developments in the Various Sectors

### 5.1 Results of the Primary Sector

The production volume of Dutch agriculture and horticulture in 2002 remained the same compared to the previous year (table 5.1). In beef farming and calf fattening a remarkable recovery of the production level took place, 20% and 12% respectively, after the sharp fall in 2001 caused by the outbreak of Foot and Mouth Disease. Milk production was slightly lower in 2002. The production of pork decreased by 8% mainly as a result of the government's buying-up scheme that is part of the environmental policy. In 2002 the production of poultry meat rose by 1%, egg production decreased by 3%. In 2003 the production in these last two sectors will probably decrease due to the outbreak of the Avian Influenza. This disease was, as is common with this type of animal diseases, suppressed by stamping out of infected stock and movement bans for poultry, poultry manure and eggs. The restocking procedure of infected farms takes place under strict conditions. It will therefore take some time before the poultry sector can completely resume its normal operations. In the horticultural sector the production volume rose slightly; the strongest increase took place in the bulb sector (+5%). In arable farming production remained stable, as a result of less potato production on the one hand and more production of other arable products on the other hand.

The average price of all agricultural products in 2002 decreased by 1%. Broadly speaking, prices for animal products fell, prices of arable products stabilised and prices of horticultural products

**Table 5.1** Value added of agriculture and horticulture in the Netherlands, 2000-2002

	Value added in EUR billion			Index 2002 (2001=100)		
	2000 (p)	2001 (p)	2002 (est)	volume (est)	price (est)	value (est)
Production value, total	19.7	20.7	<b>20.3</b>	100	99	99
Horticultural products	7.6	7.7	<b>7.8</b>	101	101	102
Arable products	2.0	2.5	<b>2.5</b>	100	100	100
Grassland based livestock products	4.3	4.4	<b>4.3</b>	101	97	97
Intensive livestock products	4.2	4.3	<b>3.9</b>	98	95	92
Other	1.7	1.9	<b>1.8</b>	92	104	96
Intermediate consumption (goods and services)	10.7	11.3	<b>11.4</b>	99	102	101
Gross value added	9.0	9.4	<b>8.9</b>	100	95	95
Net value added	6.6	6.9	<b>6.4</b>	-	-	93

p) Preliminary; est) estimation.

Source: Statistics Netherlands; 2002 estimation LEI.

increased somewhat. Prices of fruit (+10%), cattle (+11%) and calves (+50%) rose sharply, but prices of pigs, poultry, flower bulbs and sugar beet decreased by 10% or more.

As a result the production value declined by 1%. The value of the goods and services purchased increased by 1%; in contrast to the smaller volume the prices were 2% higher, partly due to the higher inflation rate. Only energy and fertilizer were substantially cheaper than in 2002.

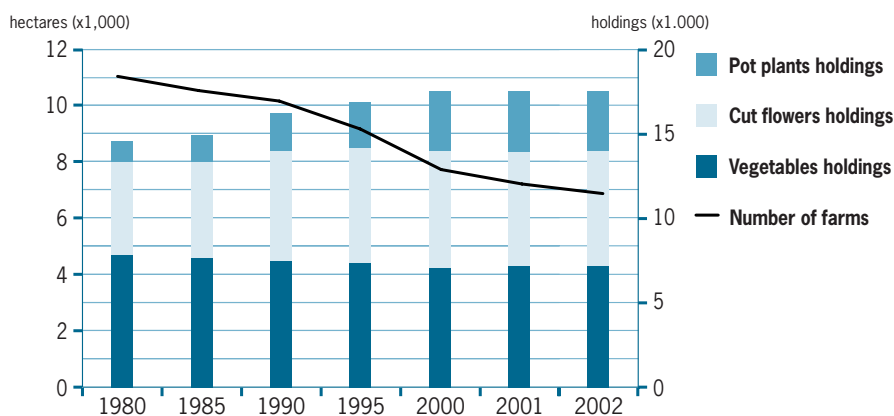
These developments have led to a decrease of the net added value of Dutch agriculture and horticulture by around 7%. Taking into account the increase in salaries paid, interest and rent and the considerable reduction in the number of farms, the average income of Dutch farmers and growers in real terms has dropped by 15 to 20% to a very low level.

## 5.2 Horticulture under Glass and Mushroom Growing

Horticulture under glass and mushroom growing together account for a quarter of the total production capacity of Dutch agriculture and horticulture. The surface area of glass increased from 10,000 ha in 1997 to 10,500 ha in 2002 (figure 5.1). The traditional glasshouse regions in the western part of the country show a reduction of the glass area, whereas an increase took place in other regions.

The government stimulates this development through subsidy schemes. The number of specialised greenhouse horticulture holdings continues to fall and in 2002 comprises around 7,100. Almost 3,200 of these specialise in cut flowers, 2,300 in vegetables and around 1,600 in pot plants. The number of mushroom growers likewise continues to fall. In 2002 their number was 440, about half the number of twelve years ago. The total area of mushrooms has stabilised in the past few years.

**Figure 5.1** Area and number of holdings with horticulture under glass, 1980 - 2002



Source: Statistics Netherlands, calculations by LEI.



**Table 5.2** Dutch family farm incomes and savings (1,000 euro) 1996-2002

	Family farm income per entrepreneur (1,000 euro)			Savings per farm (1,000 euro)		
	1996-2000	2001	2002 (r)	1996-2000	2001	2002 (r)
Vegetables under glass	64	19	<b>29</b>	33	-37	<b>-18</b>
Cut flower holdings	47	48	<b>64</b>	16	5	<b>25</b>
Pot plant holdings	53	43	<b>63</b>	24	5	<b>31</b>
Mushroom growers	37	40	<b>8</b>	8	1	<b>-37</b>
Outdoor horticulture holdings	32	37	<b>32-42</b>	6	8	<b>0-10</b>
Fruit growers	16	38	<b>30-40</b>	-3	12	<b>4-14</b>
Bulb growers	57	60	<b>35-45</b>	37	45	<b>20-30</b>
Tree nurseries	45	46	<b>39-47</b>	17	19	<b>11-19</b>
Arable farms	23	31	<b>5</b>	0	13	<b>-21</b>
Dairy farms	22	24	<b>19</b>	7	10	<b>1</b>
Pig breeding farms	22	21	<b>-11</b>	3	3	<b>-40</b>
Pig fattening farms	9	9	<b>-21</b>	-6	-6	<b>-36</b>
Closed pig (breeding and fattening) farms	27	25	<b>-18</b>	11	10	<b>-58</b>
Poultry egg farms	41	39	<b>43</b>	23	20	<b>20</b>
Poultry meat farms	14	37	<b>-35</b>	-6	28	<b>-65</b>

Source: LEI.

The total production value of horticulture under glass increased in 2002 by 4%. The value of the vegetables under glass production rose by 2%, which was mainly due to the substantially higher prices for tomatoes. The production value of cut flowers increased by 3%, also due to higher prices. The production volume of cut flowers was 0.5% less than in 2001. In the pot plant and bedding plant sector both the volume and the average price rose slightly, resulting in a 7% higher production value. The value of mushroom production decreased by some 5%, mainly due to lower prices.

Thanks to the rise in production value, which was accompanied by a rather small increase in costs, the results of the vegetables under glass holdings in 2002 substantially improved but still remained rather low. The average family farm income rose from around 19,000 euro to 29,000 euro, but savings were again negative (table 5.2).

The average family farm income from the cut flower growers and the pot plant growers increased and reached a rather satisfactory level. Savings on these holdings amounted to 25,000 and 31,000 euro respectively. Mushroom growers on the other hand were on average faced with very low incomes and negative savings (table 5.2).

## 5.3 Outdoor Horticultural Production

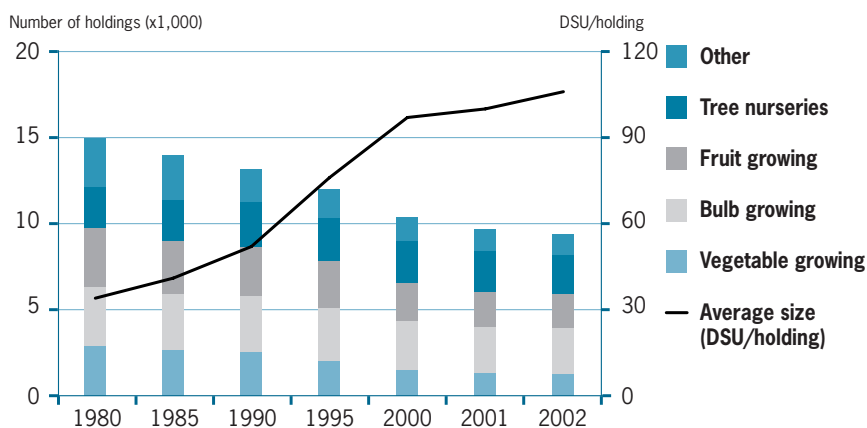
The outdoor horticultural sector includes tree nurseries, bulb growing, fruit growing and vegetable growing. It is therefore a rather heterogeneous sector. In total the sector includes around 9,400 specialist holdings, of which 1,300 are outdoor vegetables holdings, 2,600 flower bulb holdings, 2,000 fruit cultivation holdings, 2,300 tree nurseries and 1,200 other outdoor horticultural holdings, among them mixed holdings. The number of farms in this sector has declined by almost 40% since 1980 (figure 5.2), but the total surface area increased slightly.

In 2002 the total production value of outdoor horticulture was around 2% lower than in 2001. Only the tree nursery sector showed an increase in production value: a 3% larger volume was accompanied by a 2% higher average price. The production volume of outdoor vegetables decreased, but yield prices were somewhat higher leading to a reduction in production value of 5%. The production value of fruit growing and bulb growing decreased by around 5% as well.

Export of bulbs decreased considerably in the second half of 2002 (on average with 7%), both to the European Union as well as to important markets outside the EU like the United States and Japan.

The income in 2002 of outdoor vegetable growers, fruit growers and tree nurserymen is comparable to 2001 (table 5.2). The flower bulb growers are confronted with a sharp drop in income. Despite this drop their business results are still quite good and comparable to those of other outdoor horticultural holdings. All holdings in the outdoor horticultural sector will be able to save money this year.

**Figure 5.2** Number of holdings and size of outdoor horticulture holdings, 1980-2002



Source: Statistics Netherlands, calculations by LEI.

## 5.4 Arable Farming

The area of arable crops has been fairly stable in the past years at around 600,000 ha. The most important arable farming crop is the potato, in terms of share in production value. In terms of acreage cereals are the most important crop. The number of specialised farms growing arable crops has decreased to 12,635 farms; in 1980 the Netherlands had around 17,000 specialised arable farms (figure 5.3).

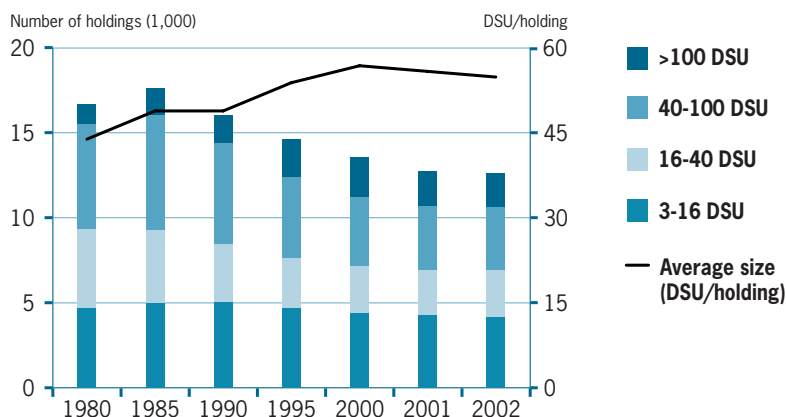
Production volume of all crops but potatoes for consumption grew in 2002. Combined with decreasing prices for all arable products this has led to a stable production value of arable farming products compared to 2001. Especially the prices for potatoes and onions showed a steep drop.

The declining prices in combination with rising costs of production have had a considerable impact on the family farm income earned (table 5.2). On average income was as low as 4,500 euro per holding, leading to negative savings of 21,000 euro. These figures also show the importance of potatoes for the results of the arable farms in the Netherlands.

Organic farmers of arable products had much better results. In 2002 575 farms produced organic arable crops on an area of almost 12,000 ha. On average in 2001/02 the family farm income on these farms was 42,000 euro, comparable to previous years. Income fluctuations seem to be less in this market segment. Savings amounted to around 14,000 euro.

Compared to arable holdings in other countries of the European Union the Dutch arable farms are smaller in terms of area; farms in the UK are by far the biggest. Measured in economic terms (in European Size Units, a unit describing the economic size of holdings) the intensity of the Dutch farms is by far the highest, partly due to the relative importance of potatoes in the Dutch cultivation plan. In most EU countries cereals are the most important crop on arable farms, accounting for more than half the area. In the Netherlands the share of cereals is not more than 25%.

**Figure 5.3** Number of holdings and size of arable farms, 1980-2002



Source: Statistics Netherlands, calculations by LEI.

## 5.5 Grassland-Based Livestock Farming

The total number of grassland-based livestock farms decreased by 1,763 compared to 2001 (see figure 5.4). Specialised dairy farms are still the largest group with nearly 24,000 holdings. Milk production showed a slight decrease. The decreasing number of dairy cows offset the higher milk yield per cow. The milk price in the Netherlands dropped by 4%, due to increasing stocks and lower prices for dairy products on the international markets.

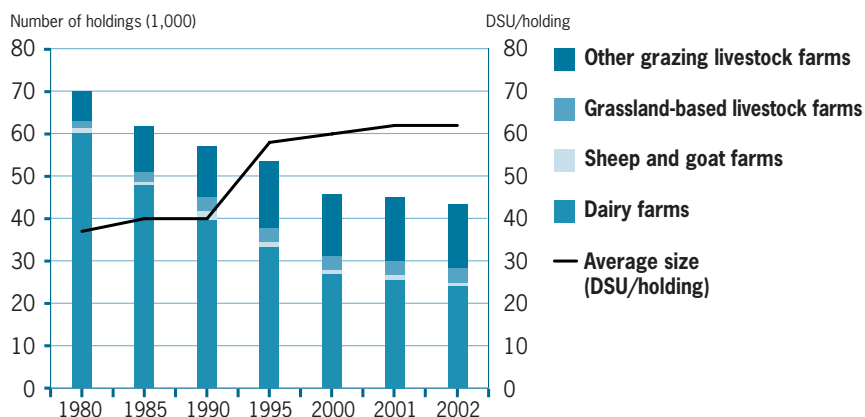
The prices for beef improved in 2002 despite lower intervention prices, which are the result of the decisions in the framework of the European Common Agricultural Policy. Production of beef in the Netherlands partly restored from the effects of the outbreak of Foot and Mouth in 2001 and BSE, but production is still considerably lower than in the years before Foot and Mouth and BSE occurred. Export of beef from the EU to third countries was limited to a small number of countries. About two thirds of EU exports went to Russia.

Prices for sheep meat were about 10% higher in 2002, mainly due to increasing export possibilities for Dutch producers to the French market. The UK is the traditional supplier of this market, but exports of the UK crumbled due to the outbreak of Foot and Mouth in this country.

The results for dairy farms are disappointing, due to the combined effect of rising costs (on average by 8%) and the lower milk price. The family farm income fell to an average of 18,500 euro per holding. Savings are on the lowest level in years with a mere 1,000 euro per holding.

The income on organic dairy farms, of which there are currently around 315, is considerably better. For 2001/02 the income is estimated at 42,500 euro, with savings amounting to 16,000 euro.

**Figure 5.4** Number of holdings and size of dairy farms, 1980-2002



Source: Statistics Netherlands, calculations by LEI.

Sheep farmers improved their results in 2002. The balance per ewe increased by 13% to 110 euro per ewe, thanks to an increased ewe premium and high slaughter prices.

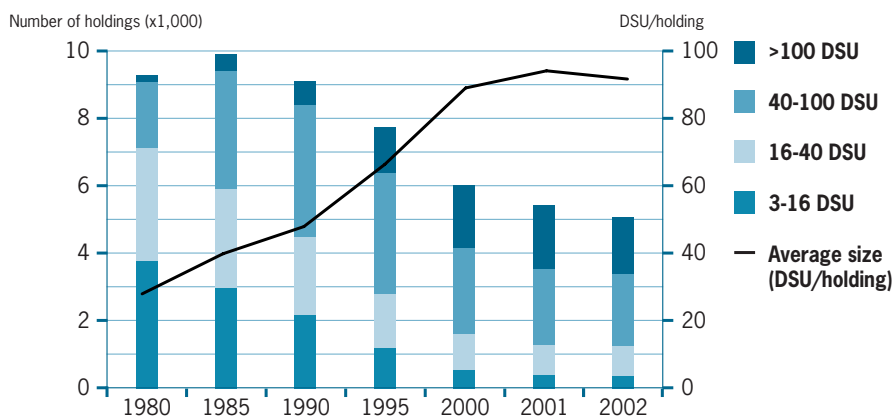
The cattle-fattening farms improved their balance by 19,000 euro compared to 2001 as a result of better prices and higher premiums. The profitability of the cattle-fattening business has been under pressure these past years. Since 1990 the number of animals has halved. Cattle fattening is usually a side activity on dairy farms.

In comparison with specialised dairy farms in other EU countries the Dutch dairy farmers have the highest milk yield per cow and per ha. The size of the Dutch farm is relatively small in terms of area. Dairy farms in the West England region are by far the largest in terms of area. Denmark comes second. Dutch dairy farmers belong to the middle group if income is considered. Farmers in Lombardy have the highest income, followed by West England and Denmark. The lower income of the Dutch farmers can be explained by the combination of high costs, especially for land and milk quotas, and a limited increase in scale these past years. In Lombardy, especially the expansion of the farms has contributed to the positive results.

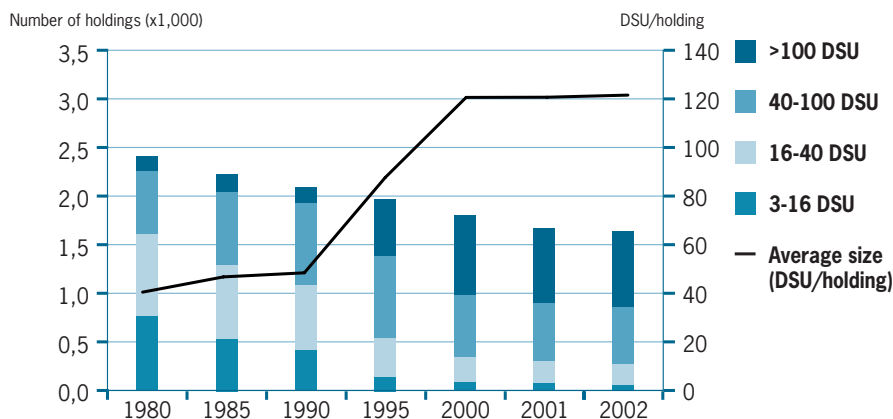
## 5.6 Intensive Livestock Farming

The number of farms in the intensive livestock sector has fallen considerably over the past years, especially the number of pig farms. This is partly due to the success of several measures of the ministry of Agriculture. With a number of subsidy schemes the government has actively bought up pig production rights, thereby significantly reducing the livestock population and consequently the number of holdings. The objective of these schemes was, among other things, to tackle the misbalance

**Figure 5.5** Number of holdings and size of pig farms, 1980-2002



Source: Statistics Netherlands, calculations by LEI.

**Figure 5.6** Number of holdings and size of poultry farms, 1980-2002

Source: Statistics Netherlands, calculations by LEI.

between the supply of manure and the amount that can be disposed of. Currently there are 8,317 holdings in this sector, of which around 5,000 have pigs and almost 1,700 have poultry. The remaining holdings mainly have cattle for fattening. The average size of pig and poultry farms has increased steadily over the past year (see figure 5.5 and 5.6).

Prices for pigs are mainly the result of developments on the European market. In 2002 the pig price fell by 13%, largely due to increasing production in the EU and other important production regions. The growth of pig production in for instance Canada and Brazil puts extra pressure on the European pig prices. Production in the Netherlands decreased by around 5%.

Prices for poultry were fairly stable in 2002 and comparable to 2001. The production of poultry meat increased worldwide. In the Netherlands production remained more or less the same. The prices for eggs were fairly reasonable in 2002, when egg production dropped by 3%.

Family farm income in the pig sector was very low for all three types of farms (closed farms (combined breeding and fattening), fattening farms and breeding farms). The low incomes can for the larger part be explained by the low pig prices. Negative savings as high as 58,000 euro clearly show the difficult financial position of a lot of pig farmers (table 5.2).

In the poultry sector family farm income was comparable to 2001 for the poultry egg farms. Thanks to a combination of lower costs, for instance for feed, and stable egg prices income is estimated at 43,000 euro with savings amounting to 20,000 euro. For the poultry meat farms income showed a steep decline, mainly due to increased production. The increase in production was a reaction to increased demand for poultry meat after the BSE crisis. However, restored consumer trust in beef has led to a decline in the demand for poultry meat, putting pressure on the prices. On average income was as low as -35,000 euro. Combined with the effects of the outbreak of Avian Influenza, the future does not look too bright for a number of farms in this sector.

# Definitions

## **Dutch size units (DSU)**

A unit describing the economic size of agricultural holdings. The DSU is based on the standard gross margins (SGM), which are calculated by deducting related specific costs from the gross returns per hectare or per animal. The SGM is expressed in ecu/euro (current prices). On the EU level, the size of farms is not measured in SGM, but in the more workable European Size Units (ESU). DSU is the Dutch variant of the ESU. The DSU is recalculated frequently in such a way that the average farm size in DSU corresponds to the development of the volume of the added value of the average farm. The 2000 DSU equals a SGM of about 1,375 euro. Some examples (on the basis of the DSU 2000): 1 ha winter wheat = 0.81 DSU; 1 ha sugar beet = 1.72 DSU; 1 dairy cow = 1.270 DSU; 1 sow = 0.247 DSU, 1 ha round tomatoes under glass = 146,9 DSU and 1 ha roses = 245.9 DSU.

## **Family farm income**

Income for the farm family arising from the farm business; this is a remuneration for the labour of all family members as well as the private capital and land.

## **Gross value added**

Gross returns minus purchased goods and services (excluding depreciation).

## **Net value added**

Gross returns minus costs of goods and services purchased from other sectors (including depreciation).

## **Savings**

The part of total income which has not been used for consumption or personal taxes, but is added to net worth.

## **Solvency**

Net value in % of total capital.

## **Total income**

Family farm income plus income from non-farm activities and social security benefits paid to the farmer and his spouse.







This report offers an English summary of the *Landbouw-Economisch Bericht 2003*. It presents a survey of the economic state of Dutch agriculture and horticulture. First, attention is paid to general economic and political developments and to the development of the agricultural complex. Next, the report deals with the rural area and with environmental issues. Following a description of the production structure and production factors in agriculture, profitability and income formation in the various subsectors are analysed.

