International comparison of pig production costs 2015

Results of InterPIG

Robert Hoste

WAGENINGEN
UNIVERSITY & RESEARCH

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Cost of pig production in the Netherlands is showing arrears compared to neighbouring countries, due to worsened feed costs, a modestly increasing sow performance, increasing manure disposal costs and increased labour costs. In piglet production, the Netherlands has a rather favourable cost position; however, the gap with Germany has reduced. In fattening, the Netherlands has very high production costs. The analysis is based on the InterPIG Network.
The cost of pig production only partially explains differences in the competitive position of countries. A conceptual model on competitiveness in pig production has been presented. Dutch producers should boost added value production. An improved cooperation of farmers, as well as with other partners in the supply chain is required.

Key words: pigs, cost of production, competitiveness, manure disposal costs

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P.O. Box 29703, 2502 LS The Hague, The Netherlands, T +31 (0)70 335 83 30,
E communications.ssg@wur.nl, http://www.wur.eu/economic-research. Wageningen Economic Research is part of Wageningen University & Research.

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Preface

The Dutch pig production is part of a European and global market. To get insight into the competitive position of the Dutch pig production an international cost comparison has been performed. This is part of the international InterPIG network with currently members of 17 countries, of which Wageningen Economic Research has been a member from the very beginning. Each year InterPIG produces a comparison of pig production costs on farm level.

In 2016, in the Netherlands a small network of Dutch companies was founded, funding the activities of Wageningen Economic Research related to InterPIG. The following companies are member of this group: ABAB accountants, Agrifirm, Boehringer Ingelheim, Hendrix Genetics, Rabobank and Vion Food Group. We had an in-depth discussion with these companies about the results of the cost comparison and its implications for the Dutch pig production. We present the main results of the analysis in this report. The analysis focuses mainly on the competitiveness from a Dutch perspective. The main analysis is therefore focused on the most important competitors from a Dutch point of view.

Prof.dr.ir. J.G.A.J. (Jack) van der Vorst
General Director Social Sciences Group (SSG)
Wageningen University & Research

Summary

S.1 Key findings

The main professional pig production countries in Western Europe have a calculated cost of about €1.40-1.45 per kg carcass weight. The Netherlands is more expensive, with €1.60 per kg. See par. 3.1.

The relative cost position of the pig production in the Netherlands has clearly worsened since 2012, compared to Denmark, Germany, France and Spain. Explanations for this worsening cost position are multiple, including a feed cost disadvantage, a modestly increasing sow performance, increasing manure disposal costs and increased labour costs. See par. 3.2.

The Netherlands has a favourable cost position in piglet production. However, the gap with Germany has reduced. In fattening, the Netherlands has very high production costs. See par. 3.3.

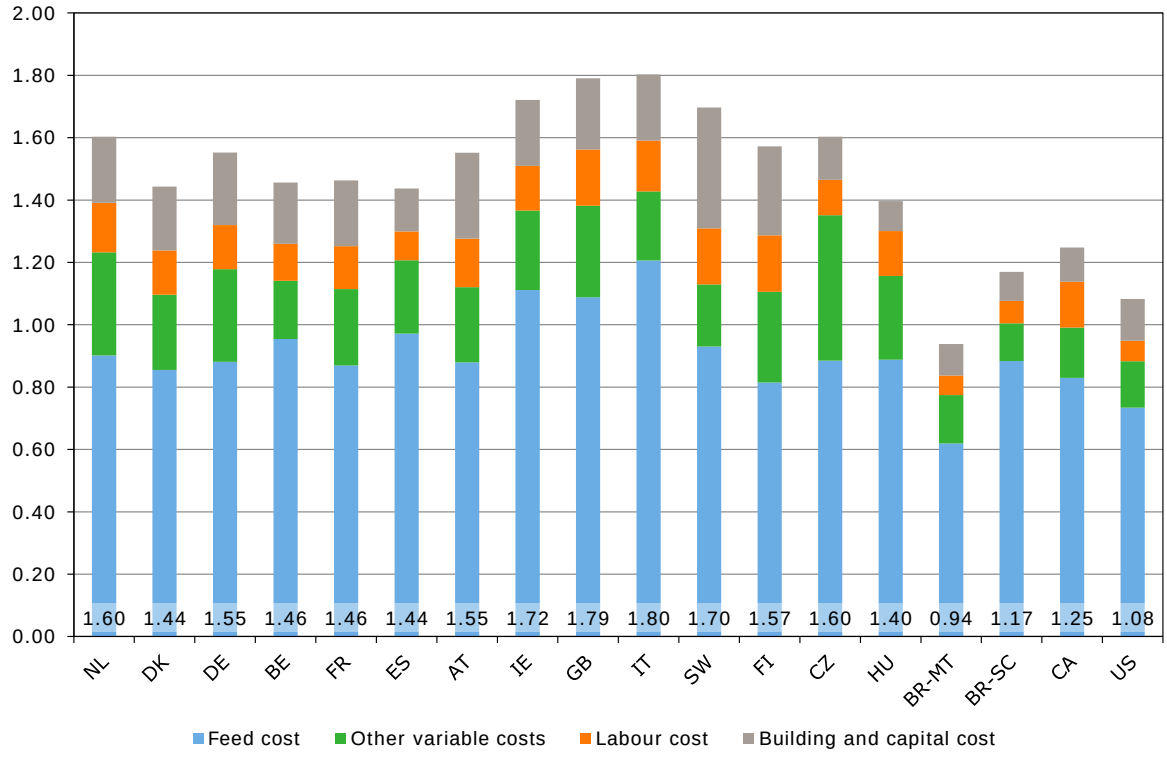

Figure S.1 *Cost of production compared (€/kg hot carcass weight), split into cost categories in selected EU and non-EU countries.*

S.2 Complementary results

A conceptual model on competitiveness in pig production has been developed, as the cost of pig production only partially explains differences in the competitive position of countries. See Section 5.

Given the fact that production costs in the Netherlands are losing ground compared to direct competitors in neighbouring countries, the need for improved revenues is increasingly clear. Dutch

producers should boost added value production. An improved cooperation of farmers, as well as with other partners in the supply chain is required. See Section 4.

S.3 Method

InterPIG is an independent forum of pig production economist in 17 countries, mainly in Europe, but also in the USA, Canada and Brazil. The method of data collection, parameter definitions and cost comparison has been developed and harmonised over time. Costs are expressed excluding VAT. The cost comparison typically reflects conventional pig production. See Section 2.

1 Introduction

The Dutch pig production is part of a European and even global market. To get insight into the competitive position of the Dutch pig production an international cost comparison has been performed. This analysis is based on the international InterPIG network with currently members of 17 countries, of which Wageningen Economic Research has been a member from the very beginning. Each year InterPIG produces a cost comparison of the cost of pig production on farm level. The analysis in this report focuses mainly on the competitiveness from a Dutch perspective.

An international cost comparison is quite a challenge, as countries have different farming systems, farm sizes, data collection, and calculation methods, as well as different sector representation in common data sets. This is one reason for the existence of InterPIG. Further information on the network and used method is given in Section 2.

Section 3 focuses on the cost of pig production in European countries; Section 4 compares European and non-European countries but to a lesser detail. In Section 5 we present a conceptual model on the competitive power of pig producing countries and pig farms, reflecting the wider perspective of competitive analysis beyond a cost comparison of primary pig production.

2 Methodological background

InterPIG

InterPIG is an independent forum of pig production economists in 17 countries, mainly in Europe, but also in the USA, Canada and Brazil. The network started in 2003 with six European countries and expanded since then. InterPIG aims to compare costs of professional pig production, based on a representative sample per country and typically reflecting the conventional pig production. UK data however reflect a blend of conventional in-house and free range pig production, due to limitations of available data sets.

Members select samples and data sources for their country. InterPIG organises an annual meeting where data, and developments in the pig production per country, are being presented and discussed. Besides, collected data are peer-reviewed among members.

The method of data collection, parameter definitions and cost comparison have been developed and harmonised over time. Main methodological assumptions are:

- Farm-gate production costs: costs on the farm are included, as well as (e.g.) direct subsidies. Levies and taxes in the abattoir are not seen as on-farm costs but taken into account as deductions of the sales price.
- Opportunity cost method. Supplies from the farm such as labour, own capital or farm-produced feed stuffs are being valued as if these inputs had to be purchased against market prices.
- Costs are expressed excluding VAT.

Still, due to limitations in available data and sometimes arbitrary choices, the cost comparison is merely indicative for cost differences between countries and cost developments over time. The InterPIG group also functions as a forum for information exchange.

Abbreviations

Seventeen countries are member of InterPIG, in alphabetic order (with abbreviations): Austria (AT), Belgium (BE), Brazil (BR), Canada (CA), Czech Republic (CZ), Denmark (DK), Finland (FI), France (FR), Germany (DE), Great Britain (GB), Hungary (HU), Ireland (IE), Italy (IT), the Netherlands (NL), Spain (ES), Sweden (SW), and the USA (US). As differences in production systems and costs within Brazil are huge, Brazil is represented as two different regions Mato Grosso (BR-MT) and Santa Catarina (BR-SC).

Forum

InterPIG is an informal forum. Meetings are being held annually in one of the member countries and are chaired by the host country. The InterPIG Development Group (comprising members of the UK, Denmark, the Netherlands and France, plus the representative of the host country) prepares discussions and decisions. Membership for new countries is possible under the precondition of sufficient (quality of) data supply. InterPIG does not produce a joint publication; however, some members do so individually.

Other methodological assumptions

For the Netherlands a number of sources are used, e.g. Kengetallenspiegel (Agrovision). Bedrijveninformatienet and Agrofoodportal (Wageningen Economic Research), Biggenprijzenschema and KWIN Veehouderij (Wageningen Livestock Research) and some market quotations for animal prices.

A production rights system is applicable in the Netherlands and Belgium. An average price of €65 per right was assumed in the Netherlands. Only interest costs of production rights are being taken into account, and only for one third of the rights, to reflect a more practical situation. Costs are taken into account in other variable costs.

Costs in this report are being expressed per kg hot carcass weight. Costs are calculated for a closed-cycle farm (piglet production, rearing and fattening). Additionally a split is made between costs of piglet production and fattening. However, the split is mainly of interest to countries such as the Netherlands, Denmark and Germany and has little focus in other countries; therefore the results in such countries might be less comparable.

The costs in the Netherlands typically represent a conventional pig production, without focus on a specific market segment or programme.

3 Cost comparison of European countries

3.1 Production costs 2015

Section 3 shows the pig production costs in the following European countries: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Italy, the Netherlands, Spain, and Sweden. After the first comparison of all these European countries, a more detailed analysis is presented on a limited number of countries: the Netherlands and main competitors Denmark, Germany, Belgium, France and Spain.

The cost comparison in Figure 3.1 shows a bandwidth of costs from €1.40 per kg carcass weight in Hungary to €1.80 per kg in Italy. The main professional pig production countries in Western Europe have a calculated cost of about €1.40-1.45 per kg. The Netherlands is more expensive, with €1.60 per kg. Most expensive producers in this group are Italy, as a consequence of the typically high slaughter weight, Great Britain, Ireland and Sweden. Great Britain and Ireland have high feed prices and consequently high feed costs. Sweden has high building and capital costs, due to high welfare requirements and rather small farms.

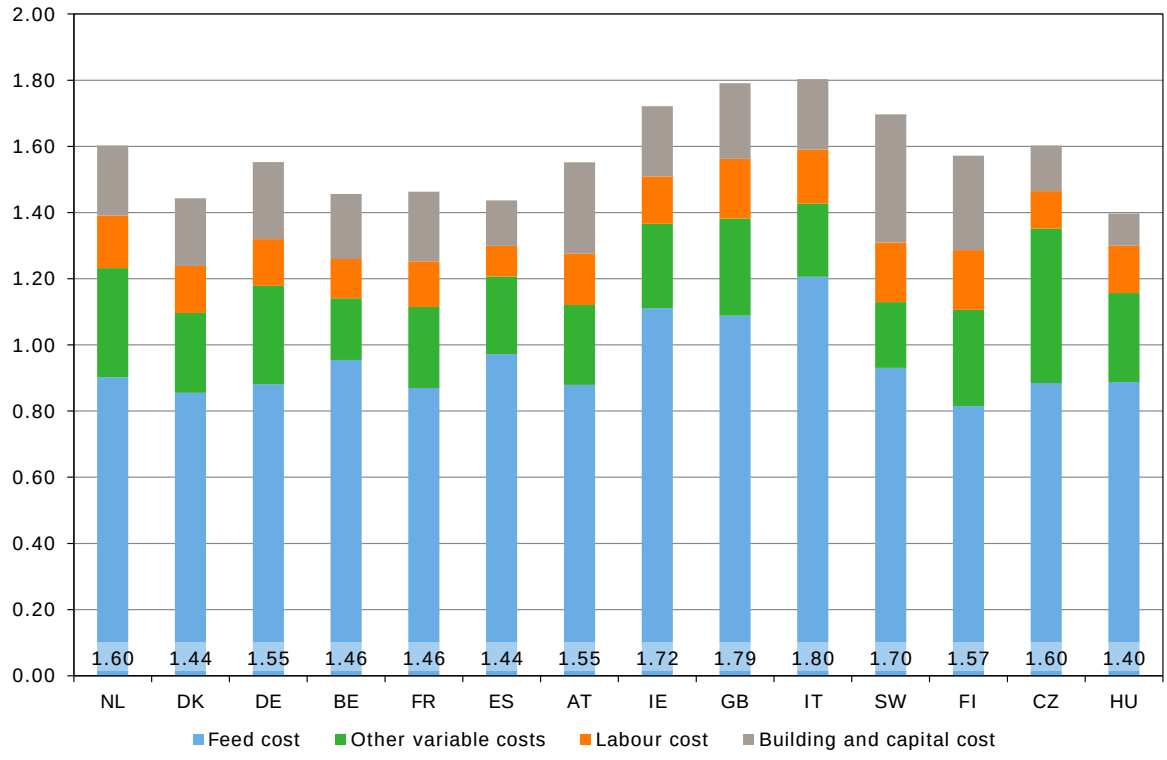

Figure 3.1 *Cost of production compared (€/kg hot carcass weight), split into cost categories in selected EU countries on a closed cycle pig farm.*
Source: InterPIG/Wageningen Economic Research, year 2015.

Table 3.1 shows costs of six selected countries, which are the most important competitors from a Dutch perspective, in more detail, split into four categories: feed, other variable costs, labour and other fixed costs (See Appendix 1 for the data for all European countries). Compared to the Netherlands, the other countries have lower costs in all cost categories, except feed costs in Spain and Belgium, and other fixed costs (buildings and capital costs), being equal in Denmark and France and

more expensive in Germany. The total cost of production in the selected countries is the lowest in Spain and Denmark, and followed by Belgium and France.

Table 3.1 *Costs in detail for some selected countries (€/kg carcass weight).*

Cost category	Netherlands	Denmark	Germany	Belgium	France	Spain
Feed costs	0.90	0.86	0.88	0.96	0.87	0.97
Other variable costs	0.33	0.24	0.30	0.19	0.25	0.24
Labour costs	0.16	0.14	0.14	0.12	0.14	0.09
Building and capital cost	0.21	0.21	0.23	0.20	0.21	0.14
Total costs	1.60	1.44	1.55	1.46	1.46	1.44

Feed efficiency

The Netherlands has the best feed efficiency (Table 3.2), which is an advantage in terms of environmental sustainability. However this is based on feed with higher contents of protein and energy, as well as due to a substantial part of producing intact boars with a better feed efficiency. Feed prices are about €20-30 per tonne higher than in Denmark, Germany and France (mixed price of total feed package on the farm), and equal to Belgium, but €5-10 per tonne cheaper than in Spain. In the end, Spain and Belgium are more expensive in feed costs per kg carcass weight than the Netherlands. In Belgium the feed consumption is rather high, which relates to the typical *ad libitum* feeding regime in fattening.

Table 3.2 *Costs in detail for some selected countries (€/kg carcass weight).*

Cost category	Netherlands	Denmark	Germany	Belgium	France	Spain
Average feed price (€/tonne)	266	237	243	263	241	273
Overall Feed Conversion Ratio[1]	2.68	2.76	2.87	2.98	2.83	2.73

Other variable costs

Other variable costs consist of Artificial Insemination and replacement costs, health costs, energy, maintenance, levies, manure disposal costs and miscellaneous variable costs. The total of other variable costs in the Netherlands are higher than in other countries (see Table 3.1), most strikingly are the high manure disposal costs (Figure 3.2). Other variable costs excluding the manure costs are rather low in the Netherlands. Differences within a country however may be important, especially in Germany. For Spain, increasing costs for manure disposal are expected.

[1] The overall feed conversion ratio is calculated as the total feed consumption on a closed cycle farm, divided by the total carcass weight (live weight) production of the farm.

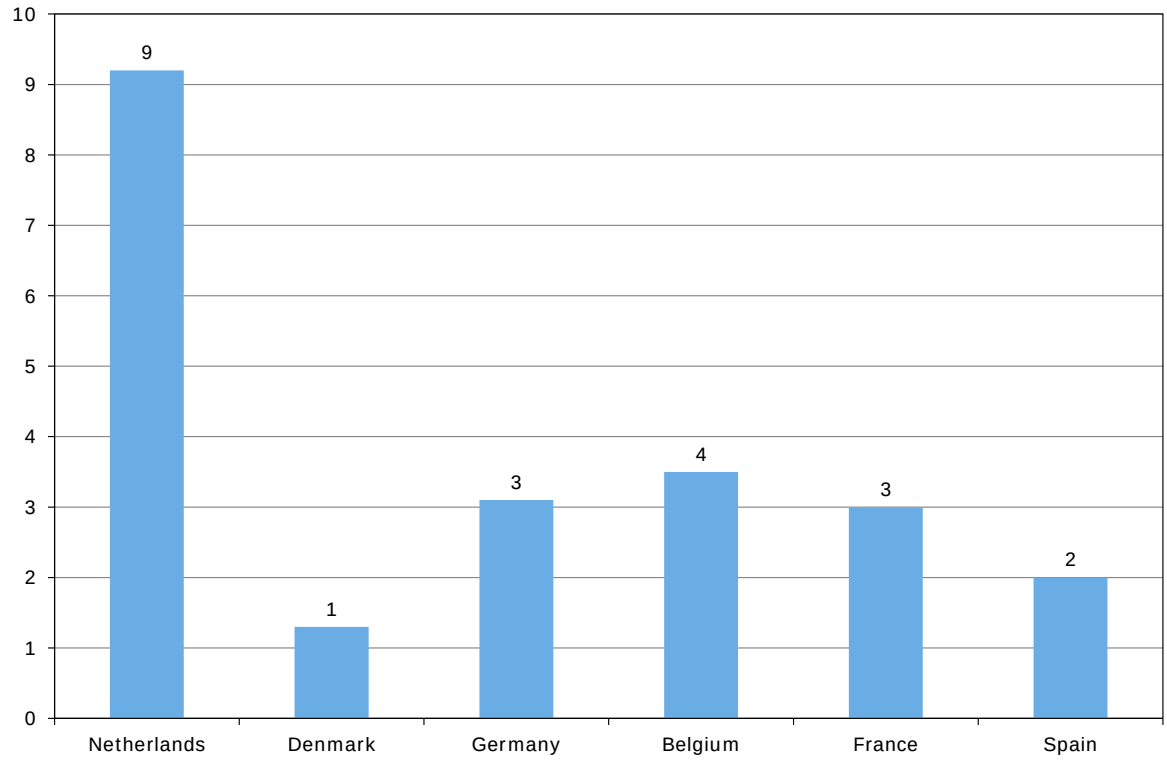

Figure 3.2 *Average manure disposal costs (€cent/kg carcass weight).*

Labour costs

Labour costs differ between countries due to differences in labour input or hourly wage (Table 3.3). Countries with high labour tariffs typically have a lower labour input. This relates to the fact that expensive labour stimulates efficiency, as well as to farm size. A high labour tariff in the Netherlands (almost €25/h) is not compensated for by a high labour efficiency (low input).

Table 3.3 *Labour input per sow (hour/year) and per slaughter pig (hour) in selected countries.*

Cost category	Netherlands	Denmark	Germany	Belgium	France	Spain
Labour per sow	7.5	10.5	12.0	10.7	13.3	8.1
Labour per slaughter pig	0.34	0.18	0.32	0.30	0.16	0.22

Buildings and capital

The total investment for one sow place including the corresponding places for rearing piglets and fattening pigs amounts to about €7,000-8,000 in the North-Western countries and just €3,500 in Spain (Table 3.4).

Table 3.4 *Investment per sow place including corresponding places for rearing piglets and fattening pigs in selected countries (€).*

Cost category	Netherlands	Denmark	Germany	Belgium	France	Spain
Investment per sow place	7,100	7,600	8,400	7,300	7,200	3,500

Reasons for differences include national animal welfare requirements beyond EU legislation (sows: 2.25 m^2 for all pregnant sows including sows in first pregnancy, and starting from 4 days after insemination for the Netherlands; fattening pigs: 0.8 m^2 in the Netherlands, 0.75 m^2 in Germany, 0.65 m^2 in the other selected countries) is reflected in these amounts. Investments for manure storage is included as well. Other reasons for different investment levels include farm size, quality of

the building (lifetime) and the ratio of number of places (e.g. countries with a high sow performance need more piglet and fattening places per sow than with a lower performance).

3.2 Cost development over time

The relative cost position of pig production in the Netherlands has clearly worsened over the last years. Figure 3.3 shows the relative cost position of some competitors compared to the Netherlands. For example: in 2005 Germany's pig sector had a cost disadvantage of almost 20 cents compared to the Netherlands; 2015 it has a cost advantage of 5 cents. The same development is seen in comparison with Denmark and France, and especially Spain has shown a serious cost reduction compared to the Netherlands.

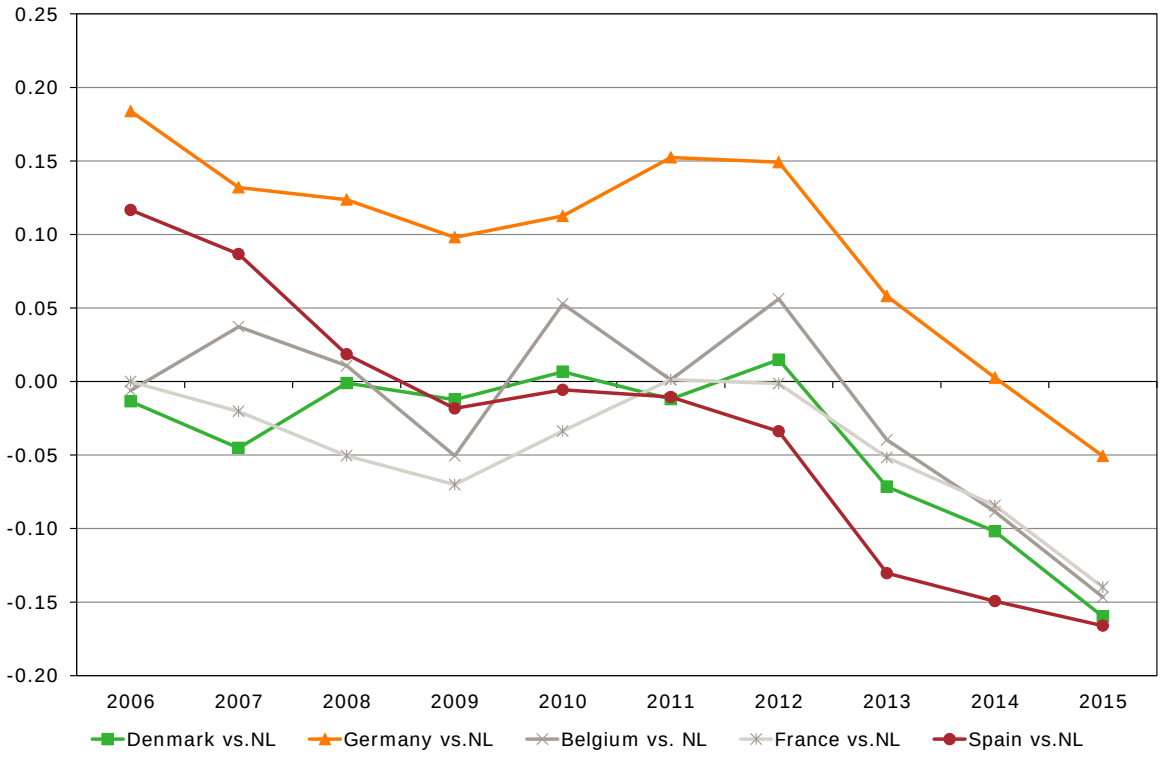

Figure 3.3 *Development of difference in cost of production of some selected countries with the Netherlands (€/kg hot carcass weight) 2006 till 2015.*

Feed costs

Reasons for the worsening cost position are multiple. Feed costs in the Netherlands have worsened, compared to the other selected countries. This is not due to worsening feed prices (price developments are equal in the selected countries), but due to the feed efficiency. The overall feed conversion ratio is calculated as the total feed use on a farm and divided by the total live weight production of the slaughter pigs; it reflects both the sow performance (slaughter pigs produced per sow and year) and the feed efficiency of all pigs. This ratio, although the lowest in the selected countries, is not improving further, whereas other countries, most strikingly Spain, show a catch-up effort (Figure 3.4).

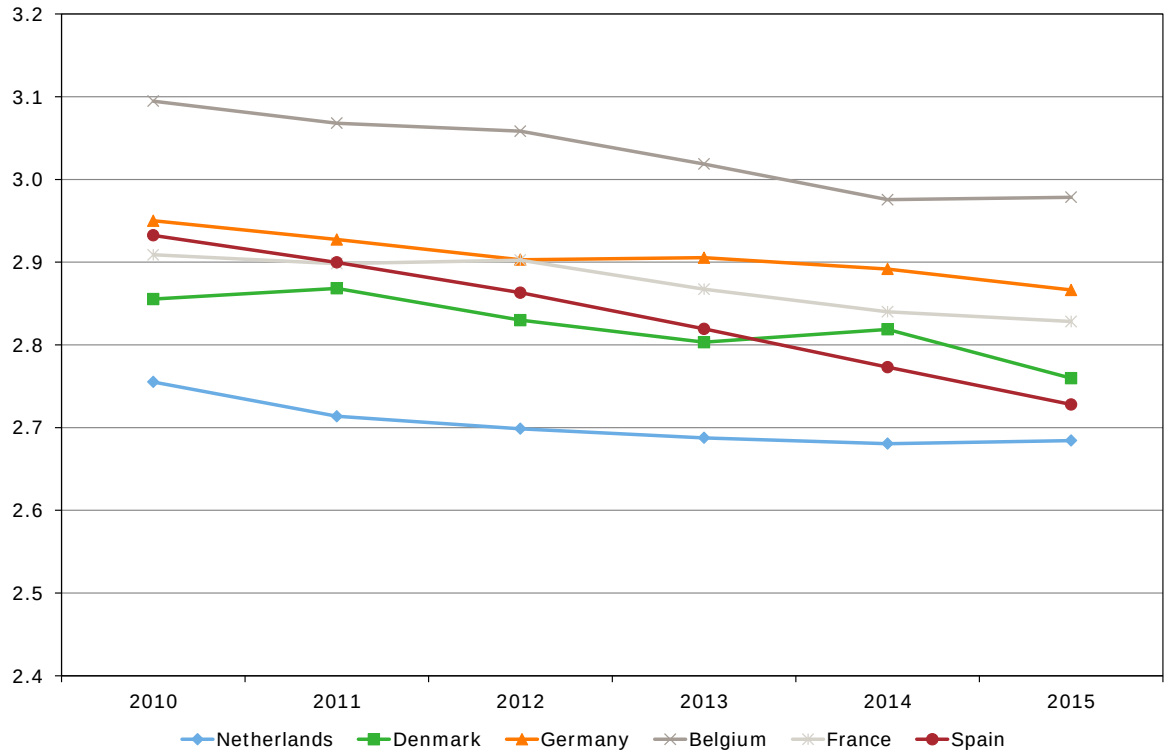

Figure 3.4 *Development of overall feed conversion ratio[2] in selected countries.*

Although no up-to-date public information is available, it seems that the share of intact boars production did not further develop in the Netherlands. However, this is apparently the same in Germany and Denmark. One can doubt whether a further decrease in feed conversion ratio is possible, which in turn would mean that the Netherlands suffers of the dialectics of progress. This effect has led the Dutch pig production to arrears compared to Denmark, Germany and Spain of about 6 to 8 eurocents per kg carcass weight since 2010.

Sow performance

The production performance, expressed by the number of slaughter pigs produced per sow and year shows an increasing line (Figure 2.8). However, the increase differs between countries, with Germany leading with 0.77 pigs per sow and year increase since 2006, Denmark comes next with 0.57, followed by the Netherlands (0.44) and Spain (0.41), whereas France (0.26) shows a modest increase only.

[2] The overall feed conversion ratio is calculated as the total feed consumption on a closed cycle farm, divided by the total carcass weight (live weight) production of the farm.

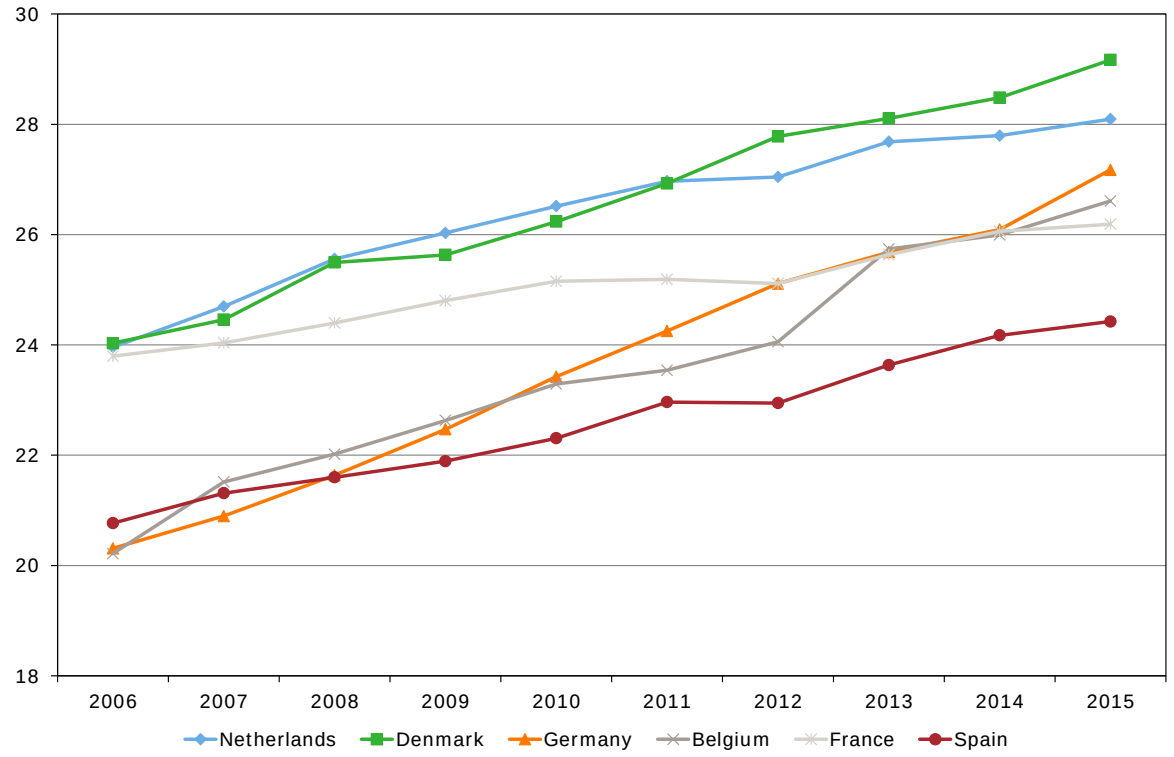

Figure 3.5 *Development of slaughter pigs produced per sow and year in some selected countries.*

Health costs

Health costs are a minor part of the cost of production, varying from 2.2% in Denmark to 4.5% in Spain. Several countries however face a shift in health costs from fattening to piglet production (Figure 3.6).

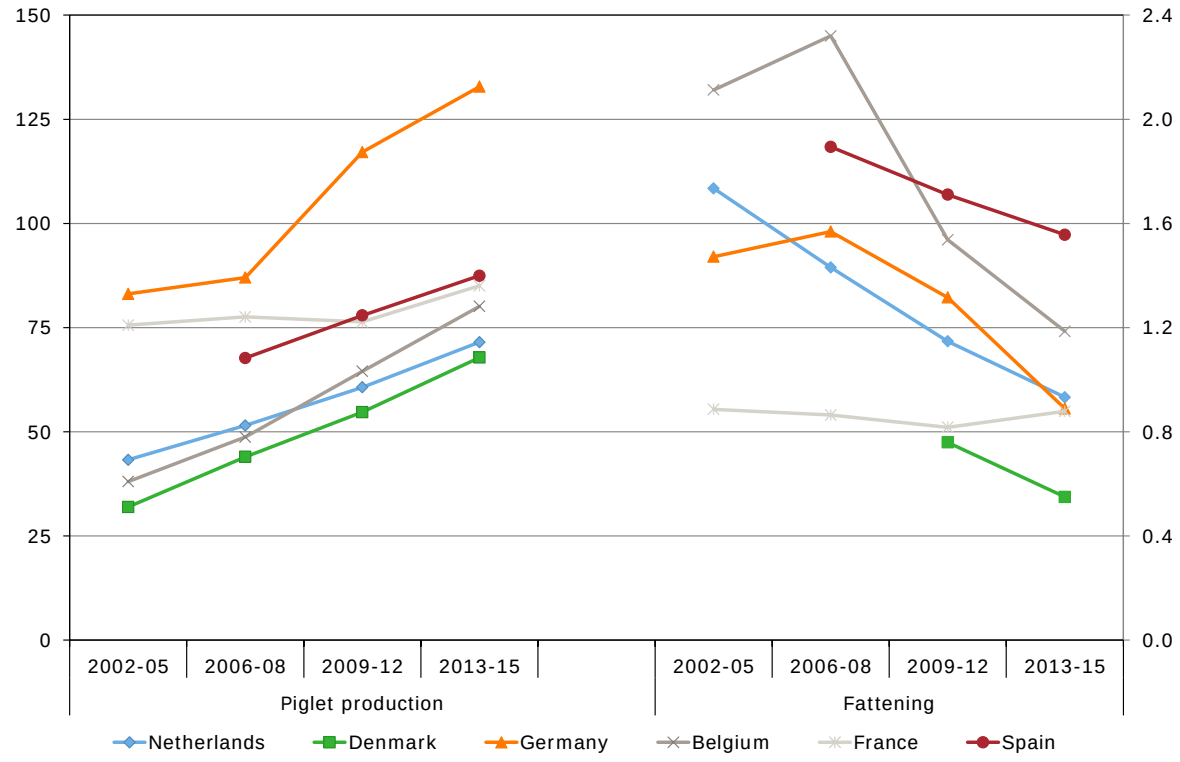

Figure 3.6 *Development of health costs in piglet production (€/sow/year) and fattening (€/slaughter pig) in four periods in some selected countries.*

Health costs show a clear increase in piglet production and equally a decrease in fattening. This is probably related to additional costs for vaccination of piglets, resulting in lower health costs in fattening. The health costs in fattening in Denmark in the earlier years are left out for data quality reasons. The total health costs (related to a closed cycle farm) do not change substantially over time, and vary from 3.5 cents in Denmark and the Netherlands to 4.5 cents in Belgium and France and slightly over 6 cents in Germany and Spain in the years 2013-15, but only a shift from fattening to the piglet production phase. This might be related to trade arguments, where a well-vaccinated piglet is more attractive to fattening farmers. This is supported by the very flat pattern in France, with its typically closed cycle farm production with a limited piglet trade.

3.3 Split between piglet production and fattening

The sow performance shows quite a lot of differences between countries (Figure 3.5). This influences the cost of production. Costs have been split into piglet production and fattening, to enable comparison of typical costs per production phase. For a meaningful comparison, we recalculated the piglet cost of production to a comparable weight of 30 kg; in the fattening phase we calculated the marginal costs per additional kg live weight. This way, we bypass differences in typical delivery weights of reared piglets and slaughter pigs between countries (Figure 3.7). Results are an approximation. As live trade of pigs and piglets typically takes place within trade blocks (e.g. the EU), cost comparison is mainly important within these blocks. Therefore comparison of piglet production costs is only shown between some selected European countries.

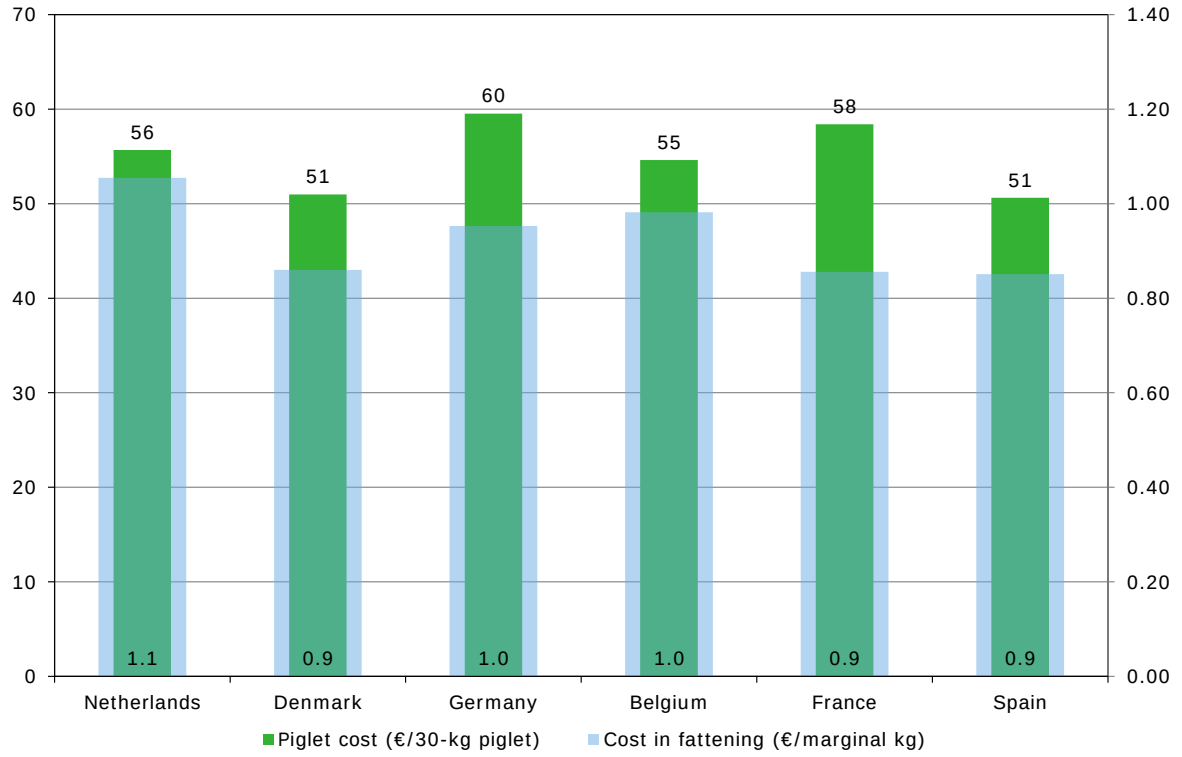

Figure 3.7 *Cost of production per piglet (€/30-kg piglet) and in fattening (€/marginal kg live weight) in selected countries.*

The cost of a 30-kg piglet in the Western European countries varies from €51 in Denmark and Spain to €60 in Germany. The relative cost advantage in Denmark and the Netherlands over Germany corresponds to the increasing piglet influx into Germany from both supplying countries.

Although the Netherlands has a rather favourite cost position in piglet production, this position has worsened over time (Figure 3.8). Especially the cost position of Germany has improved compared to the Netherlands. This is very relevant, as Germany is the main destination of piglet exports from the Netherlands as well as from Denmark.

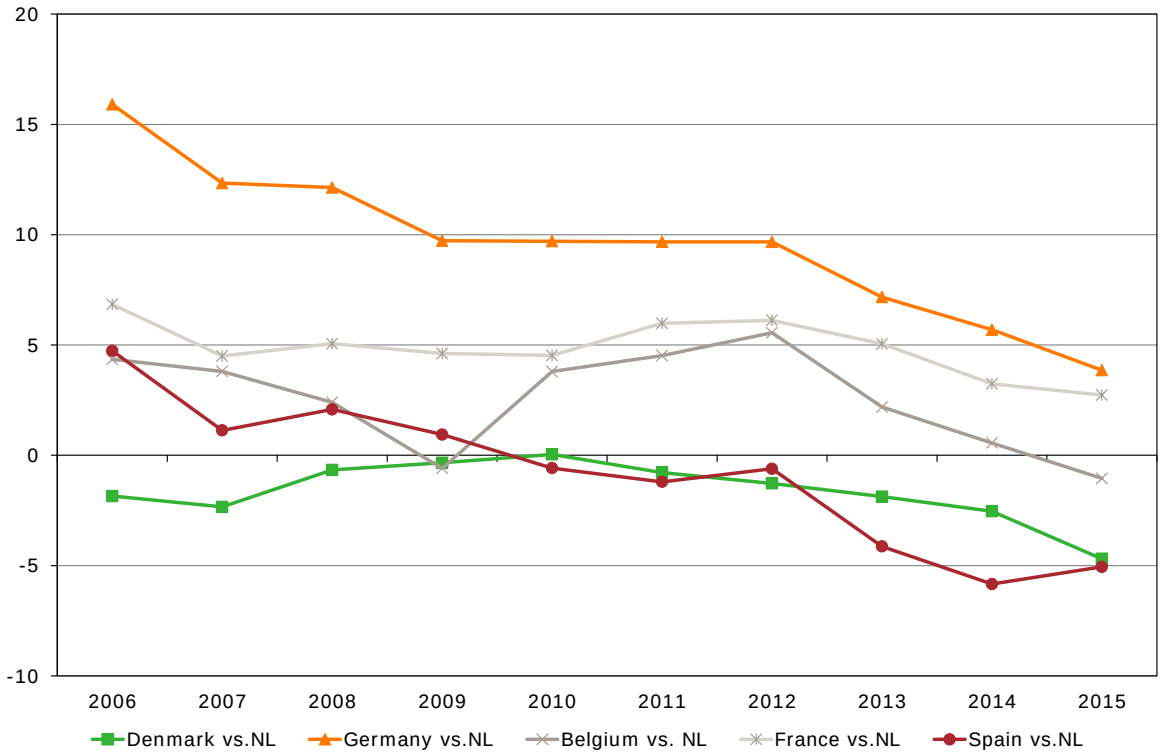

Figure 3.8 *Development of differences in piglet cost of production between selected countries and the Netherlands (€/30-kg piglet).*

Costs of fattening per marginal kg live weight differ from €0.85 per kg in Spain to about €1.00-1.10 in the Netherlands (Figure 3.7). The Netherlands is some 20 eurocents more expensive per kg than Denmark and about 10 cents more than Germany. It can be concluded that fattening in the Netherlands cannot compete on costs. An important reason are the high manure disposal costs, which are about 7 cents per kg weight gain in the fattening stage.

4 Global competition

Countries outside the EU in InterPIG are Brazil, Canada and the USA. As differences in production systems and costs within Brazil are huge, Brazil is represented as two different regions Mato Grosso (Central region, abbreviated to MT) and Santa Catarina (South East region, abbreviated to SC).

To compare the global competition, in terms of cost of primary production, an EU average is calculated on the basis of a simple average of the Netherlands, Denmark, Germany, Belgium, France and Spain.

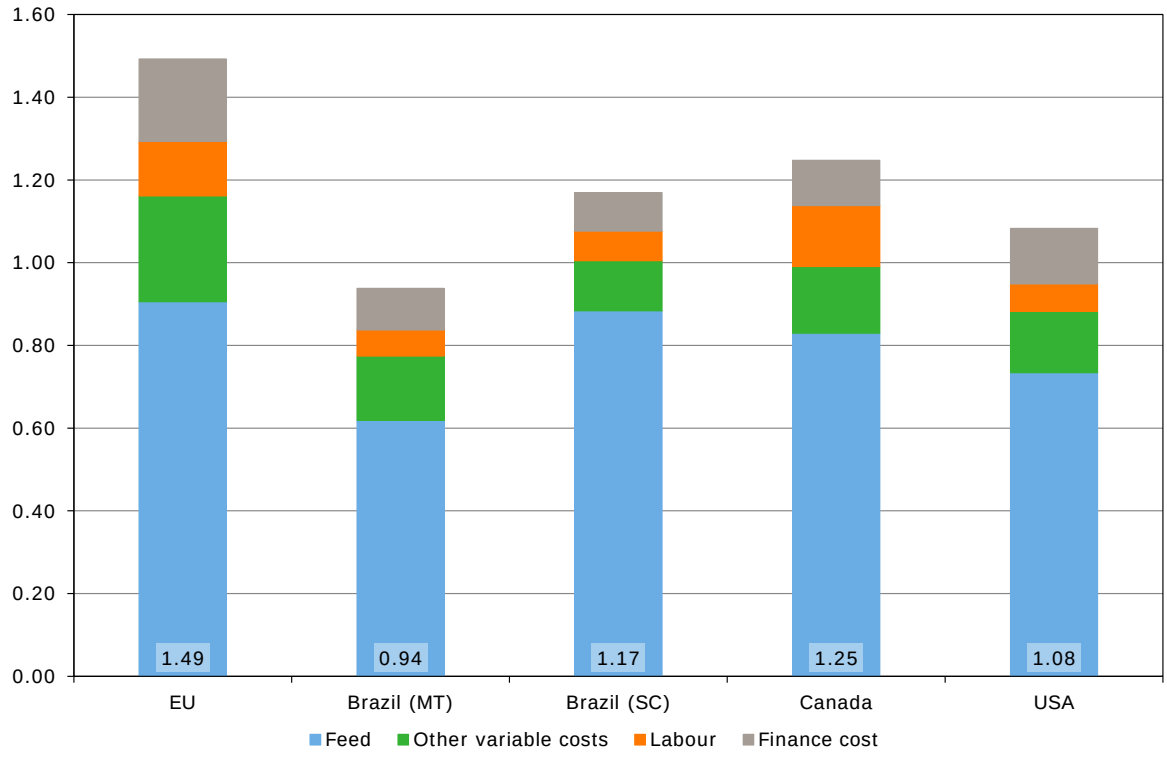

Figure 4.1 *Production costs in the EU and non-EU countries compared (€/kg hot carcass weight), split into cost categories.*

Figure 4.1 shows that production costs in the European countries (EU) are higher than in Brazil, Canada and the USA. Brazil Mato Grosso has very low costs, less than one euro per kg carcass weight. Especially differences in feed costs explain cost differences between the countries/regions.

Brazil, Canada and the USA have large quantities of feed ingredients available, which explains the low feed costs. Labour is cheaper than in western European countries, varying from €3 per hour in Brazil Mato Grosso to €11 in the USA and almost €14 per hour in Canada. Labour input per ton of carcass weight however is higher in Brazil and Canada than in the EU average. Manure costs are low in Canada and Brazil Santa Catarina or zero, opposite to main competitors in western Europe. And these non-European countries have less regulations and legislation, like for environmental protection and animal welfare.

Cost calculations are presented in euros, which means that cost calculations also reflect currency exchange fluctuations (Figure A2.1, Appendix 2). Figure 4.2 shows the development of production costs in the non-European countries since 2010. This shows partly opposite cost developments, e.g. Canada and the US show a cost increase in 2015, whereas Brazilian costs are decreasing. The relative

cost increase in the USA in 2015 compared to 2014 is partly to be explained by the increasing value of the US Dollar.

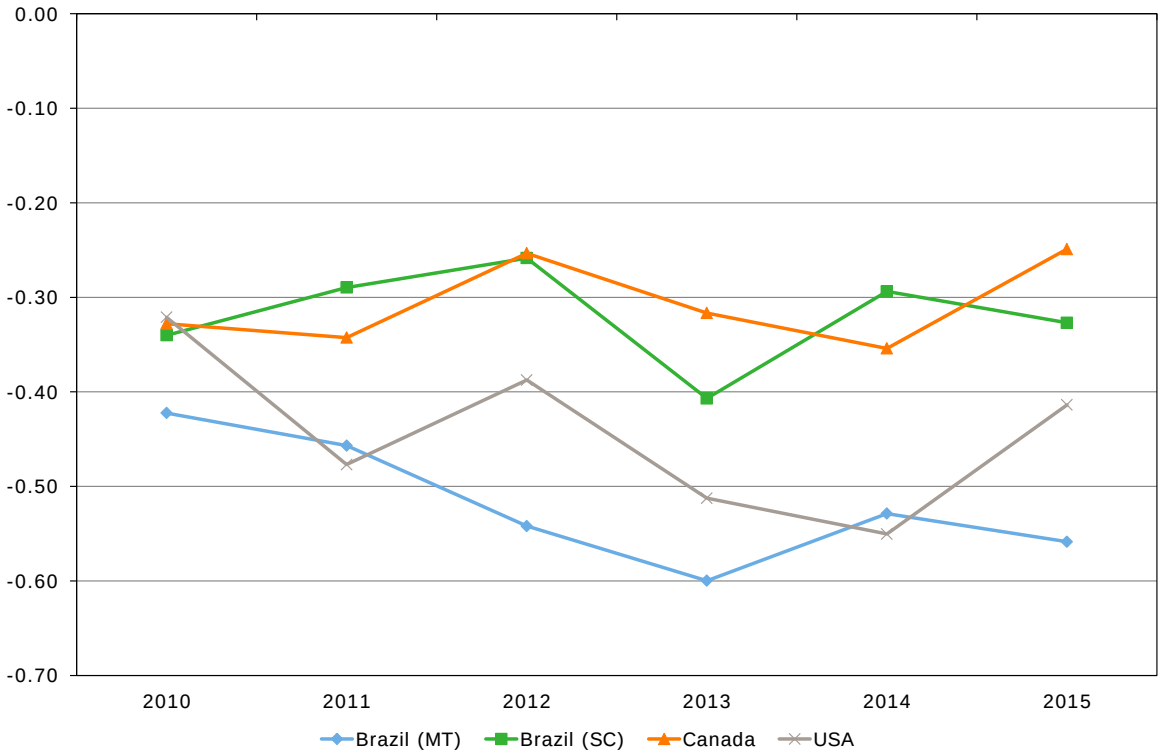

Figure 4.2 *Development of cost advantage of production in Brazil, Canada and USA over the EU (€/kg hot carcass weight).*

5 Conceptual model on competitiveness

In the previous section, pig production costs have been compared internationally. Cost of primary production however, is only one of the factors in international competition. Figure 5.1 shows a conceptual model on critical success factors for competitive power of pig producing countries and pig farms. The model is based on the theory of Harvard professor Michael Porter (1990) on the competitive advantage of nations and further developed to better suit with pig production. The model shows six clusters of success factors. The conceptual model needs to be elaborated and can be used for quantitative comparisons.

The *first* and most important is the human factor. Elements are e.g. the entrepreneurial quality of the farmer, the combined presence of three personal skills: entrepreneurship, management and stockmanship, the presence of skilled and motivated staff, and the availability of workers and price of labour.

The *second* element reflects the farm structure (e.g. specialised pig production vs. mixed farm, specialisation in piglet production or a closed cycle farm) and farm size, so the advantages and limitations of the hardware of the company. The management of this hardware (like the use of a management information system (MIS) is also included here.

The *third* element deals with the cooperativeness of the farmer and other farmers: is there a cooperative approach in e.g. breeding or feed purchase, or in knowledge exchange (like study clubs). But also the sector structure is relevant here, reflecting the hardware on sectoral level in primary production.

The *fourth* factor covers a variety of external inputs and elements, mainly the upstream elements before the farm: feeding, breeding, veterinarian capability, capital availability and readiness of banks to give loans, and risk management of the pig production process.

The *fifth* factor reflects the supply chain approach and the downstream elements, including marketing, added value market programs, market price level, and the way how the supply chain is coordinated (like spot market, or vertically integrated or some coordination system in between). The reason that factor 4 and 5 are split, although both related to the functioning of the supply chain, is that factor 4 merely influences the cost of production, whereas the downstream side of the supply chain is rather focusing at the sales and revenues. However, it is clear that producing according to a specific market program with higher demands in the production will affect both cost and revenues.

Finally the *sixth* cluster cover the external factors outside the supply chain. It includes societal demands (animal welfare, farm odour etc.), consumer demands (taste, meat price level, safety or e.g. regional specialties), and the governmental attitude towards the agriculture, including subsidy availability.

All these factors influence the profitability of pig production and the production supply chain, which is reflected in the central and *seventh* factor. For practical implementation, the model should quantified based on underlying parameters per factor, which may result in a competitiveness score per country and farming system.

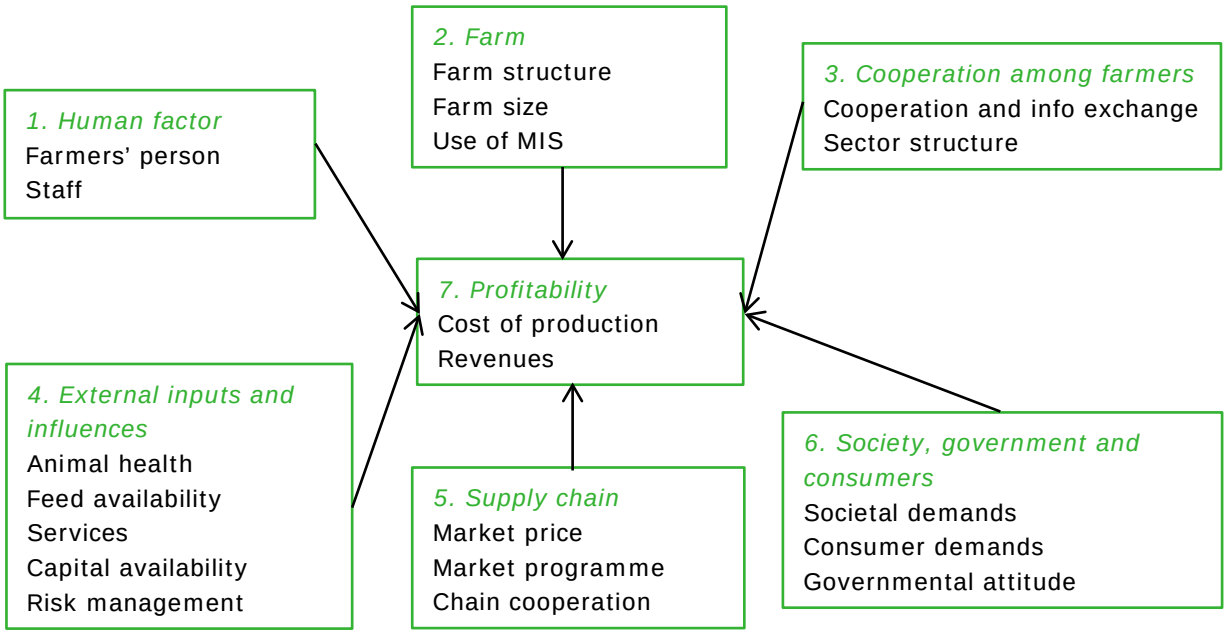

Figure 5.1 *Conceptual model on competitive factors in pig production.*

6 Discussion and Conclusions

Dutch cost position has worsened

The cost of pig production in the Netherlands in 2015 amounted to €1.60 per kg carcass weight. This is more expensive than other large professional pig production countries in Western Europe with about €1.40-1.45 per kg. Since 2012, the Dutch cost position has worsened substantially and reasons are multiple. Feed costs are 2-4 eurocents higher than in neighbouring countries, except in Spain, where feed costs are 7 cents higher than in the Netherlands. Manure disposal costs (part of the 'other variable costs' have increased to 9 eurocents per kg carcass weight in the Netherlands. However, still this explains only part of the gap. Labour costs are slightly higher. Apparently the development of the zootechnical performance has improved less than in most other countries. All these effects cannot be explained by the partial transition in the Netherlands towards production in market programs, as these effects have been left out as far as possible.

Feed margins unchanged

Farmers in the Netherlands supposed that feed industry margins for compound feed in the Netherlands had increased in 2015 compared to the years before. This was assumed to be driven by increased risks for the feed industry of late payment and no-payment by farmers, due to the bad market situation in 2014 and 2015. To this end, we performed a price development comparison of the ingredients (optimal diets per animal type) and the compound feeds (weighed average of feed types for a closed cycle farm). No increasing margin could be found.

Piglet production cost positive

The Netherlands still has a rather favourable cost position in piglet production, however, this position has worsened over time compared to main competitor Denmark and main export destination Germany. In fattening the average costs in the Netherlands are far higher than in neighbouring countries.

Substantial differences between farms

It can be questioned how farmers in the Netherlands can survive such relatively high costs, where the market price here is not above average. Farm situations are very different and so are production costs: differences of 20 cents per kg carcass weight are found among farms. Farmers are improving their zootechnical and economic performance, which results in both high animal productivity and increase in scale of production. Another part of the farmers simply cannot survive and has to quit production. Every ten years, the number of farms with pigs is reduced by 50%, and this trend has been found since the eighties already. This reflects the tough economic situation in the sector. Some of the farmers are making the transition to producing in market programmes such as 'Beter Leven*' and 'Varken van morgen'. However, typically the additional costs are being covered in such programs and only in specific farm situations do the additional payments lead to additional profits.

Competitiveness is more than production costs

The presented conceptual model on competitiveness in Section 4 shows that cost of pig production only partially explains differences in the competitive position of countries. Costs and revenues are equally important. Outside EU, Brazil is the country with the lowest cost of production. However, also costs for slaughter and processing, and transport should be taken into account, as transport of pig meat in Brazil to the harbour takes place over a distance of about 2,000 km over moderate-quality roads. Another aspect to compare the competitive position of a production country is related to e.g. stability of trade relationships and sensitivity to volatile currency exchange ratios. Export opportunities of specific parts of the carcass may improve the carcass valorisation, but is also related to risk susceptibility. Such aspects are only to a limited extent reflected in a cost comparison. It is concluded that a competitiveness analysis among countries should be based on more than a cost comparison.

More cooperation needed

Given the fact that production costs in the Netherlands are building up arrears compared to direct competitors in neighbouring countries, the need for improved revenues is increasingly clear. To this end, the producers should work more closely together, both as primary producers, and as supply chains. The forces and risks in production chains are increasing, with increasing export of pig meat from the EU to third markets and increasing risks for market shocks due to border closures (as a consequence of e.g. an outbreak of animal diseases or protectionist behaviour) and sensitivity to currency exchange ratios. Additional to this, many farms in the EU are growing away from the typical family farm model, where own capital and labour are (were) important cushioning factors for market fluctuations. Plus, the society in many Western European countries show what we could call an *agrophobia* (aversion to agricultural production), as citizens are increasingly unfamiliar with agricultural production and might have some fear to it.

Risks of third-market exports

Due to increased risk exposition we consider it valuable for the European pig production to be reluctant to further increase exports to third markets. And export should focus on added value products, rather than considering the third markets as an outlet for low-valued products. Another issue that could cushion market fluctuations is to improve entrepreneurship, as well as increase the farmers' financial buffer, rather than farm size.

Conclusion

We conclude that the Dutch cost position has clearly worsened since 2012, despite however being unable to point to one single reason for this. It is merely a combination of getting arrears in performance and efficiency increase, increasing costs for feed, labour and manure disposal, compared to neighbouring countries. Still, in piglet production the Netherlands has a rather favourable position, although worsening as well compared to main competitor Denmark and main export destination Germany. In fattening, the average costs in the Netherlands are far higher than in neighbouring countries.

Focus on added value production

Since cost of production is only part of the competitive scene, we conclude that the Netherlands should boost the added value production. An improved cooperation of farmers (horizontal cooperation), as well as with other partners in the supply chain (vertical cooperation) is required.

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Varkensrechten.nu

Appendix 1 Cost breakdown and some parameters and prices per country

Table A1.1 *Cost of pig production in European countries, split into cost categories (€/kg hot carcass weight, excluding VAT).*

Cost type	NL	DK	DE	BE	FR	ES	AT	IE	GB	IT	SW	FI	CZ	HU
Feed	0.90	0.86	0.88	0.96	0.87	0.97	0.88	1.11	1.09	1.21	0.93	0.82	0.89	0.89
Other variable costs	0.33	0.24	0.30	0.19	0.25	0.24	0.24	0.26	0.29	0.22	0.20	0.29	0.47	0.27
Labour	0.16	0.14	0.14	0.12	0.14	0.09	0.16	0.14	0.18	0.16	0.18	0.18	0.11	0.14
Building and capital costs	0.21	0.21	0.23	0.20	0.21	0.14	0.28	0.21	0.23	0.21	0.39	0.29	0.14	0.10
Total costs	1.60	1.44	1.55	1.46	1.46	1.44	1.55	1.72	1.79	1.80	1.70	1.57	1.60	1.40

Table A1.2 *Some production parameters and prices in pig production in European countries (for an explanation, see below).*

Parameter	NL	DK	DE	BE	FR	ES	AT	IE	GB	IT	SW	FI	CZ	HU
Average feed price	266	237	243	263	241	273	230	303	289	262	241	211	233	214
Overall FCR	2,68	2,76	2,87	2,98	2,83	2,73	3,05	2,80	2,93	3,78	2,95	2,94	2,99	3,36
Labour tariff	25	22	18	16	19	14	15	14	16	15	22	18	6	5
Labour input	6,4	6,4	7,9	7,6	7,2	6,6	10,4	10,6	11,2	11,3	8,0	10,0	21,1	30,2
Manure disposal costs	9,2	1,3	3,1	3,5	3,0	2,0	-1,0	1,5	1,1	1,5	-1,7	2,4	-0,9	0,0
Investment per place	7,100	7,600	8,400	7,300	7,200	3,500	9,300	3,900	4,700	7,800	10,300	10,400	4,100	2,500

Explanation: Average feed price (€/tonne) relates to the entire feed consumption on a closed cycle farm and includes cost savings by home-mixing; Overall FCR is the overall Feed conversion ratio, reflecting the entire feed consumption on a closed cycle farm divided by the total live weight production of slaughter pigs; Labour tariff (€/hour); Labour input (hour per tonne carcass weight); Manure disposal costs (eurocent/kg carcass weight); Investment is the total amount for one sow place including corresponding places for rearing piglets and fattening pigs (€/place)

Appendix 2 Currency exchange ratios

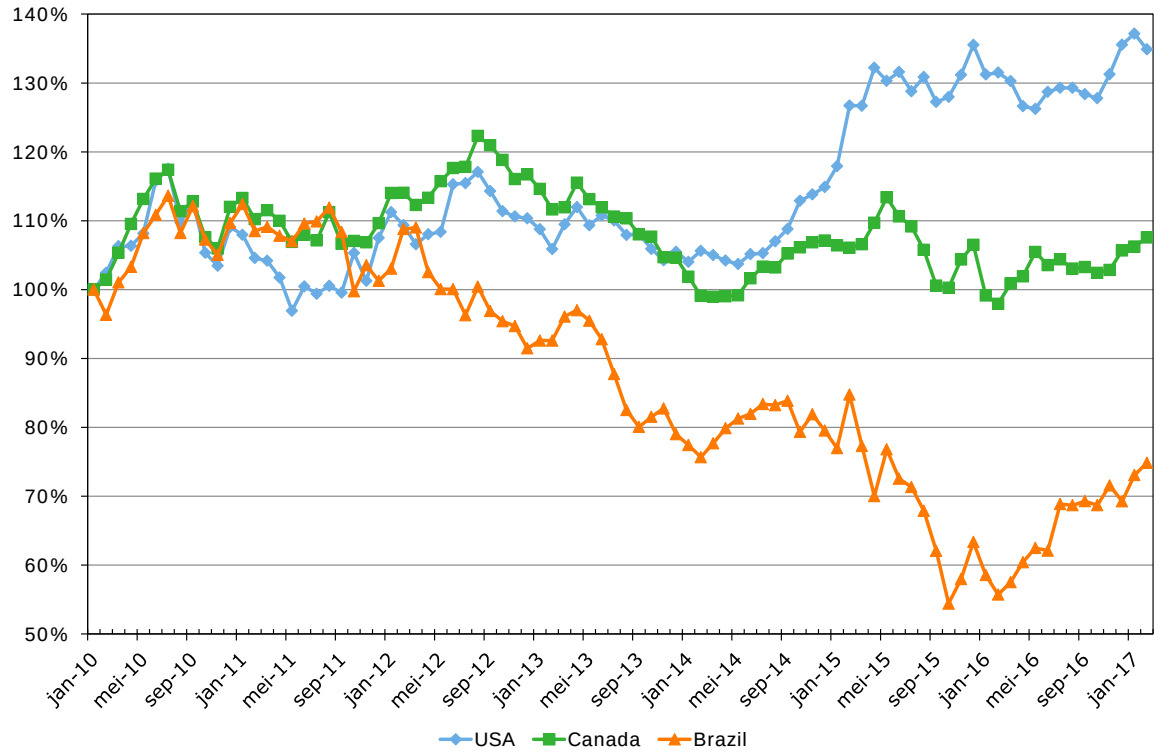

Figure A2.1 *Currency exchange ratios of US Dollar, Brazilian Real and Canadian Dollar compared to the euro (Index January 2010=100%).*
Source: InforEuro, processing Wageningen Economic Research.

Wageningen Economic Research
P.O. Box 29703
2502 LS The Hague
The Netherlands
T +31 (0)70 335 83 30
E communications.ssg@wur.nl
www.wur.eu/economic-research

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Wageningen Economic Research
P.O. Box 29703
2502 LS Den Haag
The Netherlands
E communications.ssg@wur.nl
www.wur.eu/economic-research

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