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De Hoeve

Case study report

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‘De Hoeve’ pork supply chain

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Summary

De Hoeve case study concerns a relatively small scale pig meat supply chain which includes (in 2004): chain director 'De Hoeve' Ltd owned by the two initiators, 16 pig producers organised in an association, a slaughterhouse, a meat cutter/wholesaler and 26 high quality butchers, operating under the *Keurslager* hallmark, in the province of Brabant. De Hoeve functions as chain director and is responsible for the overall management of the supply chain. This entails among other things commercial transactions: the weekly purchase and sale of 900 pigs produced according to the criteria of the *Environmental certification label*. Setting up a short regional supply chain for certificated fresh pig meat that meets specific requirements (logistics, technical quality) of *Keurslager* butchers, has not only resulted a more transparent FSC but also in a more efficient one. The extra value added generated by cost reduction, with consumers prices equal to conventional FSC, is redistributed among all chain members. All chain members profit from the new FSC.

De Hoeve pig meat supply chain has emerged in response to negative side effects of the conventional marketing strategy: the weak position of farmers, environmental pollution and increasing legitimacy problems. In a bottom up and step by step approach the initiators developed a new pig meat supply chain for environmental certified meat. Starting point were a number of technical (environmental) novelties in pig breeding and the certification of pig meat produced. This certification came about with substantial support of a strategic alliance of environmental and societal organisations and public funding. Subsequently the initiators extended the strategic alliance with chain partners and created a *new market outlet* for this certified pig meat, implying a *new division of roles* and *new agreements* with regard to pricing, logistics and production.

The capacity to mobilise a strong support network, a shortening of supply chain and mutual sharing of knowledge, information and experiences turned De Hoeve into a successful initiative. All partners benefit from the created efficiency and extra value added what results in a more stable supply chain. Societal legitimacy and support for the initiative was created by mobilising societal organisations and have them involved in the development of sustainability indicators and better environmental and animal welfare performances in comparison to the conventional pig meat supply chain.

The De Hoeve supply chain is however still rather small scale in terms of volume and sales. De Hoeve is also vulnerable because of a *conventional bypass*. Substantial part of the pigs produced by the associated pig farmers is dependent on the conventional market outlet. Furthermore, consumer involvement is still limited. The pig meat is promoted to consumers as regular but environmental certified pig meat and not as something of special value.

So, reducing dependency on the conventional bypass, creating a more *distinctive* product and developing an appealing (own) *brand* could be strategic cornerstones to further develop and scale up the De Hoeve initiative.

Although the contribution of De Hoeve supply chain to sustainable rural development is still very modest in terms of generated extra value added and volume sold, it does set an example: it is possible to construct more sustainable FSC, even in a very competitive and tough market.

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1 Introduction

Case studies for recommendations enhancing sustainability

This report is part of the European SUS-CHAIN project 'Marketing Sustainable Agriculture: An analysis of the potential role of new food supply chains in sustainable rural development'. It contains the results of one of the 14 case studies on sustainable food supply chains initiatives in seven EU-countries (Belgium, Germany, Switzerland, United Kingdom, Italy, Latvia and The Netherlands). Within the broader SUS-CHAIN objectives, the case studies aim at a more in-depth and fine-tuned understanding of the dynamics of food supply chain initiatives at micro and meso-level and to provide empirical data to validate the central SUS-CHAIN hypothesis:

- *Scaling up* an initiative in the field of new food supply chains changes the *nature of the (chain) organisation* (network structure, rules, values etc) and its *sustainability performance*,

That is split up in three sub-hypothesis:

- Scaling up depends on commercial performance and appropriate public support.
- Nature of organisation changes with scaling up as an effect of growth in market power and of the increased pressure of economic constraints and logics.
- New food supply chains have a positive effect on rural sustainable development.

See Brunori *et al.* (2004) for detailed information on the objectives of the case studies in the SUS-CHAIN project and the case study methodology.

'De Hoeve': a bottom up approach to enhance sustainability in pig meat supply chain

In The Netherlands *De Hoeve* pig meat supply chain initiative is chosen as one of the two case-studies. For several reasons the *De Hoeve* initiative represents an exceptional and promising pig meat supply chain. First, the *De Hoeve* initiators advocate an alternative vision to the future for pig farming in The Netherlands: they relate a more regionally embedded type of pig farming to sustainable rural development. In their opinion, pig farming should be re-embedded in the rural area, implying a.o. an explicit choice for family farm based type of pig farming with low dependency on external labour. This vision is contrasting with the prevailing agro-industrial perspective, where further scale enlargement and concentration of the pig meat supply chain is advocated. In more radical versions, the pig meat supply chain has to be concentrated in large scale agro-industrial stores, located at agro-industrial sites. Pig meat production will then no longer be hampered by claims to preserve rural amenities, such as the landscape, and is expected to be competitive on global markets. This radical agro-industrialisation entails an adieu to the family farm too. The *De Hoeve* initiative is clearly an alternative to this. Second, the *De Hoeve* initiative is pro-active in counterbalancing the loss of legitimacy and integrity of pig meat production, often described as losing its 'societal licence' to produce. *De Hoeve* has developed and implemented an *Environmental Certification Label* for pig meat production. Furthermore they managed to successfully commercialise this environmental certified pig meat to regional butchers, by linking better environmental performances to specific pig meat quality requirements of the butchers. Third, they developed a new supply chain based on strong partnership and a transparent and coherent chain management, including the active participation of pig farmers.

In summary, the bottom up approach with regard to the development of complementary technical, institutional and organisational innovations and promising sustainability

performance makes the *De Hoeve* an interesting case in the view of the question how the pig meat sector and agro food sector in general can be made more sustainable.

A step by step and action oriented case study methodology

The case study methodology can be characterised by a step by step and action oriented approach with the SUS-CHAIN case study methodology as guideline (table 1). The case study started with a meeting explaining the objectives of the SUS-CHAIN project and case study to the initiators of *De Hoeve* and look for mutual benefits for further cooperation. During this meeting it was agreed that the case study methodology would build as much as possible on available research material on *De Hoeve* and that it would develop as much as possible also new and relevant knowledge for *De Hoeve* by organising visits to similar pig meat initiatives in other countries. *De Hoeve* showed particular interest in initiatives abroad that would focus on the exchange of information and experiences on chain organisations and sustainability performances. Becoming part of the methodology, the visits allowed the researchers of the Rural Sociology Group (RSG) to map and analyse the development of *De Hoeve* chain, whereas *De Hoeve* were facilitated in their desire to reflect on its own performances by arranging exchange meetings with foreign initiatives.

In close cooperation with *De Hoeve* two exchange meetings with other pig meat initiatives have been organized: the *Vita* project in Belgium and the *Neuland* initiative in Germany. The meetings included several excursions to relevant chain actors as slaughterhouses, meat cutters, wholesalers and meat processors. Subsequently, the *Vita* project was invited for an excursion to the chain partners (pig farmer, meat cutter, and butcher) of *De Hoeve* in The Netherlands.

The results of these visits are verified by participating actors and included in the overall case study report. In close interaction with the initiators of *De Hoeve* information gaps were identified and solved by additional interviews and external reports. Finally also two research seminars, one in Belgium and the other in the Netherlands, have been organized to disseminate the overall case study findings and to discuss actual impact of *De Hoeve* approach and its potential contribution to sustain pig meat production in the Netherlands with a broader public.

Table 1: Research approach

<i>Step</i>	<i>Objective</i>
Step 1 Preparation	Obtaining a general view about the organisation and performances of the pig meat sector and <i>De Hoeve</i>
Step 2 Introduction interview with <i>De Hoeve</i>	Identification of mutual benefits for a cooperation between <i>De Hoeve</i> and the Rural Sociology Group
Step 3 Organising exchange of knowledge and experiences	Comparing the chain organisation and sustainability performances <i>De Hoeve</i> with <i>Vita</i> project (Belgium) and <i>Neuland</i> (Germany)
Step 4 Case study reporting	- Writing the results from step 1 -3 into the case study lay out - Identifying and solving information gaps by additional interviews and external reports - Verifying the results by <i>De Hoeve</i>
Step 5 Dissemination	- Assessment of the impact of <i>De Hoeve</i> approach and performances on sustaining the pig meat sector by seminars

Contents of the report

De Hoeve can not be understood without taking into account some of the historical and institutional context in which it emerged. In Section 2 we present a short historical overview of the Dutch pig meat sector and a characterisation of the conventional pig meat production

in the Netherlands. As will be shown, conventional chains are dominated by a focus on global competitiveness and cost price reduction as principle coordination mechanism, by often instable chain relations and little transparency and coherency in overall chain management. These chain characteristics go along with clearly negative side-effects such as: environmental problems, growing societal concerns about animal welfare and a weak position of pig farmers in overall chain management (easily exchangeable).

In Section 3 highlights the organisational profile of *De Hoeve*. *De Hoeve* has to be understood as a specific response to negative effects of conventional chains. Section 4 describes and analyses how *De Hoeve* succeeded to develop a new pig meat supply chain. It will be shown that *De Hoeve* is characterized by a bottom up as well as step by step approach. The initiative started with technical innovations to improve environmental sustainability performances of regional pig farming. After the successful development of an *Environmental Certification Label* for pig farming, a process of trial and error started to establish the required new networks and alliances for the creation of a new pig meat chain based on a newly developed set of rules and regulations for pig farming, logistics and pricing method. Finally we show that *De Hoeve* chain is currently actively looking for different way's to realize an up scaling of its initiative.

Section 5 continues with a more in depth reflection on the institutional and organisational characteristics of *De Hoeve* and its sustainability performances. This is done by an analysis in which the specific features of *De Hoeve* are compared to national conventional meat supply chains, national organic pig meat production as well as different interesting examples of pig meat supply chain initiatives abroad (so-called *satellite cases*). Finally, in Section 6 the findings with regard to the central hypothesis and sub hypothesis are presented and the impact and potential of *De Hoeve* approach for further sustaining of the pig meat sector is discussed.

2 The Dutch pig meat sector

2.1 Introduction

The emergence and development of sustainable food chain initiatives cannot be understood without taking into account the historical and institutional context. In this chapter we will present a short overview of the overall characteristics of the Dutch pig meat sector with a specific attention for aspects such as characterisation of chain members, chain organisation, national regulations and overall performances. This serve a better understanding of the *De Hoeve* case presented in section 3.

2.2 Characterization of chain members

Primary production

Pig meat production in The Netherlands is concentrated in the southern and eastern provinces, regions traditionally dominated by relatively small scale agricultural land use which made pig meat production in particular in the sixties and seventies in the 20th century an easy accessible as well as economically attractive activity to stay in farming. The expansion of national pig meat production based on highly intensive production systems, strong institutional support and the import of cheap fodder from all over the world, lasted until mid eighties when its negative impact on the environment became so manifest that national governance decided to regulate pig (and poultry) production volumes by introducing a quota system based on environmental rights. Since then developments in pig production are first of all characterized by an ongoing concentration of production volumes. Total number of pig producers decreased in the last decade with almost 60% from around 23.000 in 1995 till just above 11.000 in 2003 (LTO, 2004). A second structural development concerns the growing number of so-called closed pig farms, where the reproduction and fattening is integrated again at the same farm-enterprise. This is a counter reaction to decades of specialization in pig meat production, where breeding activities, reproduction and fattening were split up. This development towards closed pig farms is primarily to be understood as a farmers' response to national regulations aiming at risk reduction of the spread of animal diseases in intensive husbandry.

Processing industry

The processing of pig meat in the Netherlands has been traditionally dominated by small scale farmers' cooperatives. In the last decades, however, all cooperative slaughterhouses disappeared in the overall process of scale enlargement of the processing industry. More recently slaughterhouses started to integrate wholesale trade in their companies. At the level of slaughter, processing and wholesale trade the Dutch pig-chain is, therefore, more and more concentrated in a limited number of enterprises. In 2000 there were still 10 slaughterhouse-companies. In 2002, the two largest slaughterhouses took care of 75 % of the total number of slaughters (*Dumeco*, 55 %; *Hendrix Meat Group*, part of the multinational company *Nutreco*, ± 20 %; Bunte *et al.* 2003). In 2004 *Sobel*, the parent company of *Dumeco*, took over *Hendrix Meat group*. There is a strong competition between the slaughterhouses as for the purchase of living pigs. The slaughterhouses have an interest in the maximum utilisation of their capacity. Because of the overcapacity of the Dutch slaughterhouses, the competition with foreign slaughterhouses is intensified. Pig-farmers compare the weekly-determined prices of the Dutch slaughterhouses with the prices on the German market. Long term agreements between slaughterhouses and pig farmers (on numbers, prices and delivery moments) do not (or hardly) exist.

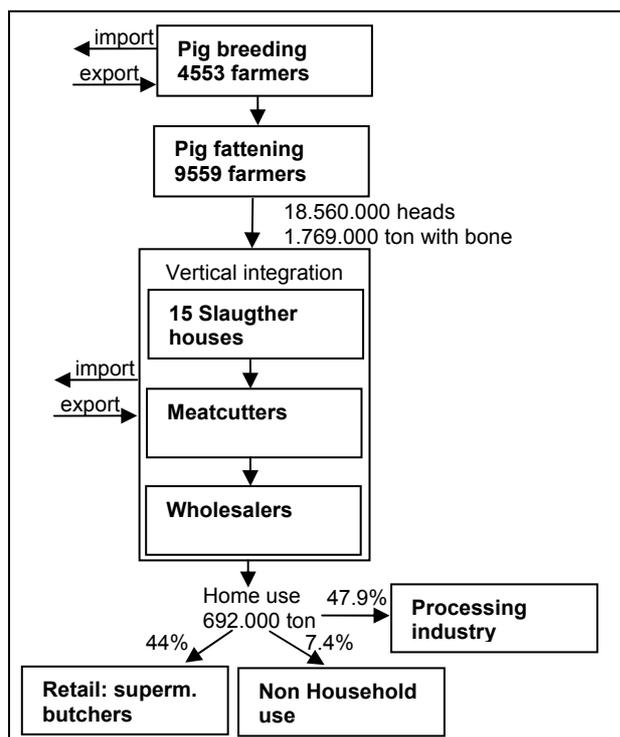


Figure 2.1 Dutch pig meat food chain (Bunte *et al.*, 2003; PVE, 2003)

Relations between pig farmers, processing industry and supermarkets

The relations between pig farmers, processing industry and supermarkets can be characterized as follows:

- At the moment, there is hardly any contact between farmers and processors on the one hand and consumers on the other; the control is nearly completely in the hands of supermarkets (Tacken *et al.*, 2001).
- Concerning pork, research (Bunte *et al.*, 2003) shows there is a positive price-asymmetry to the disadvantage of pig farmers; that means that the supermarkets don't pass on price-decreases on farm-level to consumer-prices, but do pass on price-increases to consumer-prices.
- Industrial interests and industrial logic prevail over interests of primary producers. In this logic it is important to maintain a 'critical quantity'. According to some important leaders of agro-industry the Dutch pig-sector has now reached this critical quantity. Not because of the number of pig-farmers but because of the supply food industry, slaughterhouses etc.: "the number of pig farms could decrease, but not the number of pigs" (Janssens, 2003).
- In general there is an ongoing integration and co-operation between breeding-, food supply- and processing industry. Processing industries are more and more orientated towards retail/supermarkets, but there is a lot of international competition.
- The main project/initiative concerning sustainability and food safety is *IKB (Integrale Keten Beheersing)*, i.e. Integral Chain Control and Management. A very large part of the partners in the pig meat supply chain (organisations of slaughterhouses, trade, meat-products industry, food supply industry, supermarkets, butchers, farmers and others) are working together in this initiative. *CBL* (an important overarching organisation of supermarkets) advises its members to buy (and sell) only *IKB*-certified pig meat or meat that is 'equivalent'. The two largest slaughterhouses and processors (*Dumeco* and *Hendrix Meat Group*) want *IKB* certification to become a delivery condition. Important elements of the *IKB*-system are the inspection and sanctioning system; the traceability; demands on the animal food, hygiene and the use of animal-medicines; monitoring of forbidden substances; the meat hallmark *PVE/IKB*. From time to time the *IKB*-system is adapted to new demands (PVE, 2002). In the view of (especially) the industrial partners *IKB* is important to secure markets and/or to get their hands on new markets (on the long

term this should be in the interest of pig farmers). The radical pig farmers organisation *NVV* wants to develop an own type of *IKB* with no differences on the field of food-safety but with a stronger position of pig farmers and cheaper. After comparative research on national quality-control-systems the *EHI* (*Euro Handels Instituut*, Euro Trade Institute) already two times has concluded that the *PVE/IKB* system has the best results on a number of relevant criteria (*PVE*, 2002). A large part of the pork sector is proud of the quality and safety of the Dutch pig meat. But on the other hand, there still are image-problems and food-scandals (in particular originating in the animal food industry: *MPA*, dioxin).

Regulations

The most important present governmental regulations concerning pig production are:

- Law Restructuring Pig-farming (1998; containing the reduction of the number of pigs);
- Regulation on the production and use of manure (maximum amount of manure per hectare)
- Regulation concerning contagious animal diseases: a.o. rules on transport, hygiene and cleaning measures for vehicles, measures to prevent contagion etc.
- Where animal welfare is concerned, the construction of national regulations is considered as too troublesome. Therefore the European regulations set the tone.

Coherency in overall chain management

The Dutch pig meat chain can be also characterized by distinguishing demand driven (pull) versus supply driven (push) factors. Demand driven factors dominate in particular downstream chain partners (slaughterhouses, wholesaling, processing industry, supermarkets). In the fresh meat market supermarkets and (international) slaughterhouses make more and more on (short term) agreements about margins, packaging, actions and delivery. Slaughterhouses start also to use local/regional consumption data that allows them to offer tailor-made meat assortments to supermarkets.

Stream upwards (traders, pig farmers) pig chains are much more characterized by a supply driven (spot) market. Long term contracts between slaughterhouses and pig farmers (on numbers, delivery, prices, specific quality criteria) hardly exist. By comparing week prices pig farmers easily change delivery from Dutch to German slaughterhouses when the latter offer higher prices. Slaughterhouses are doing the same and easily change suppliers when pig prices are cheaper elsewhere. Uncertainties in pig supplies in terms of quality, numbers, prices, etc. continue to be therefore highly present in the processing and commercialization of pig meat in The Netherlands. In other words; the organisation of pig meat chain shows little coherency in the overall chain management.

2.3 Overall performance

We characterized the national pig meat chain by the dominance of cost price reduction as principle coordination mechanism, by its often instable chain relations and by its limited coherency in overall chain management. The consequences of these characteristics of national pig meat chains in terms of sector performances can be summarized as follows:

Cost price reduction is meeting its limits

By specialisation and coordination on price and standardised quality the Dutch meat sector developed into an efficient bulk production, as expressed in a national self-sufficient rate of 223% and a contribution of the sector to the total added value of the national agro complex of 21.5% in 2000 (including poultry). The dominant development trajectory, however, is meeting more and more its limits. First in economic terms. Sector experts foresee as a result of governmental regulation regarding animal welfare, environment, food safety that average cost price of pig meat in 2005 will increase with 0,09 € per kg live weight. Average cost prices of most important competitors as Germany and Denmark would no more increase

than about 3 euro cent (Bond *et al.*, 2002). In other words, the competitiveness of the national pig meat sector at international bulk markets is clearly deteriorating.

Loss of integrity and societal licence to produce

Other contributions of the SUS-CHAIN project illustrated in detail the range of societal concerns about the negative side-effects of industrial pig meat production in the Netherlands (ammonia emissions, surplus of minerals, negative consequences on animal welfare, food safety issues (dioxins in animal feed, etc.), the integration of large industrial pig meat plans in small scale rural landscapes, etc.). As a whole this range of concerns can be summarized in terms of a loss of integrity of pig meat production or a loss of societal *licence to produce* for industrial pig farming. This is also illustrated by the ongoing national debate about the issue to what extent pig farming can be integrated with other rural functions. One of the debated questions is e.g. if pig meat production should be concentrated in agro-industrial clusters at industrial sites, just like other industrial activities. Pig farming would be completely disconnected from rural areas and specific rural concerns.

Meanwhile national government and the pig meat sector try to restore societal trust and the sector's reputation by implementing generic regulation and food safety assurance systems (*IKB*). Recent research shows, however, that underlying goals of these efforts (better image, acceptance of more stringent environmental norms, etc) get little support from even chain members (Bogaardt *et al.*, 2003). Again, this is primarily explained by chain characteristics as a focus on cost price reduction, imbalance of power relations, information asymmetry and an overall lack of trust between chain members.

Farmers hardly involved in responses of the sector to changing consumer values

Dutch consumers purchase fresh pig meat in particular at supermarkets (82% of total national consumption). The same consumers purchase decisions are dominated by a combination of motives as: price, convenience, taste, health and the type of user moment (PVE 2004, Brandsma *et al.*, 2004). Marketing research shows that welfare lifestyles gain importance that satisfy other needs like self-respect and self-development next to basic needs. Also the trend towards more individualisation causes a more differentiated and unpredictable consumer behaviour. A third relevant trend concerns socio-demographic changes. The increase of double-income and one-person-households results on the one hand in consumers that want to save time and that put more weight to convenience than to the attributes of sustainability. On the other hand it is stressed that double-income households have a higher available income and that in particular elderly people (due to the ageing of the population) focus more on health and sustainability aspects. From a broader marketing perspective it is concluded that globalisation and modernisation are creating new risks that also give room for sustainability labels. All these trends should be taken into account in product development and the specific positioning of sustainable products (Bijman *et al.*, 2003; Meulenberg, 2003; Vuursteen, 2001).

National slaughterhouses and meat industry try to respond to these changing consumer values by market segmentation, product differentiation and a growing interest in extra value added creation. The largest national company *Best Meat*, for example, has taken over *Nordt Fleisch* in Germany. The objective is to get access to German distribution channels for pre packed, easy to cook meat (Van Doorn in Akkerman, 2003). Commercializing specific parts of a pig for premium prices is most crucial. It adds more value to the complete carcass. For example, spare ribs can be sold for € 7.25 / kg in the EU, whereas in the EU the price for spare ribs does not exceed € 2.75 / kg (ABN-AMRO, 2002). Also breeding organisations and other slaughterhouses (*Pigtone group*) started to pay specific attention to market segmentation, for instance by using a certain type of boar for a specific meat concept for the English bacon market. Ongoing initiatives, however, continue to be dominated by a focus on the technical aspects of pig meat production as better meat cutting efficiency and pay much less attention on specific food quality criteria as distinctiveness in terms of taste,

sustainability, etc. It should be also emphasized that pig farmers get mostly no active role in these adding more value at the `end of chain` activities. It is therefore rather doubtful if this segmentation and differentiation will strengthen overall sustainability performances of the supply chain.

2.4 Conclusion

We showed that the Dutch pig meat supply chain has been very successful in terms of delivering standardised quality meat against low prices. However, it has been also illustrated that the future of the national pig meat sector is rather insecure as a consequence of the following characteristics:

- The former success of chain co-ordination based on the principle of cost price reduction is more and more confronted with severe limitations (environmental impact, lack of rural space for ongoing scale enlargement and loss of international competitiveness).
- Societal support for industrial pig meat production is deteriorating given its negative side effects in terms of food safety scandals, environmental problems, growing animal welfare concerns and the impact of industrial pig meat production on rural amenities (loss of societal licence to produce).
- National pig meat chains are dominated by the absence of trust relations between chain partners, which results in instable chain organisations and an overall limited capacity to develop system innovations that adequately respond to changing societal and consumer demands.

3 Objectives and state of the art

3.1 Introduction

Within the overall context as described in section 2, our case study concerns a relatively small pig meat chain which includes the following principle actors: chain director *De Hoeve*, 16 pig producers, slaughterhouse *Westfort*, meat cutter and wholesaler *Hems* and 26 high quality butchers (members of the *Keurslager* association) in the province of Brabant. Figure 3.1 visualizes the overall characteristics of this relatively small pig chain, named after the limited company created by its two principle initiators that will be introduced in section 4.

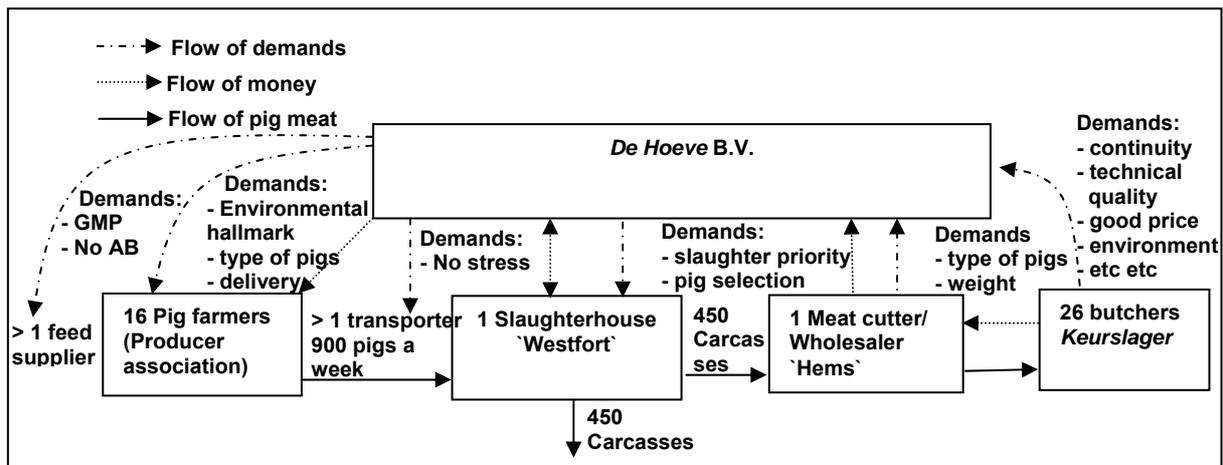


Figure 3.1 Organisational profile of *De Hoeve* chain in 2004

3.2 Background and general objectives

De Hoeve is to be understood as a specific response to the internal and external problems that confront conventional pig meat production in The Netherlands. As concluded before, within current chain organisations pig farmers are easy exchangeable, highly anonymous and financially vulnerable chain members. As a whole this can be identified as the internal problem of national pig meat production. The external problems refer to the societal concerns about the negative side-effects of industrial pig farming (environment, animal welfare, food safety, impact on rural amenities, etc.). In particular in regions as the Peel, with a high concentration of intensive husbandry, societal organisations mobilised their influence on politics and public opinion to improve sustainability performances of pig meat production, including the use of all available legal opportunities to oppose against pig farmers in search for scale enlargement. *De Hoeve* represents a specific approach to counterbalance these internal and external problems of (regional) pig farming. The initiative starts in 1996 with the following objectives:

- to develop a robust chain concept for sustainable pig meat production building on the *Environmental Certification* system (Appendix 1).
- to develop a transparent chain that aims to reconnect regional pig farming with society and rural landscapes.
- to create *room for manoeuvre* in standardized governmental environmental regulation for alternative approaches to realize sustainability goals.

3.3 The organisation of De Hoeve

It is important to stress that the organisation of *De Hoeve* chain as presented in figure 3.1 is to be perceived as the outcome of a dynamic process of continuous changes (details again in section 4). Currently *De Hoeve* functions as a director responsible for the overall chain management. First this contains the weekly purchase of approximately 900 pigs from the 16 regional producers organised in an association. As share holder of *De Hoeve*, this association has a rather strong position in overall chain management. Second, *De Hoeve* carries the responsibility to sell the pigs to slaughterhouse *Westfort*. This slaughterhouse selects the carcasses that meet the quality criteria as defined by *De Hoeve* in close cooperation with regional butchers. At the presence approximately half of weekly total production of 900 carcasses meets these specific quality criteria. These carcasses are transported to meat cutter/wholesaler *Hems*. The other half sells *De Hoeve* to slaughterhouse *Westfort* and is commercialized as anonymous pig meat. Meat cutter *Hems* other responsibility concerns the processing of carcass in technical parts according to the demands of regional butchers as another expression of the presence of strong chain relations between production and consumption.

It is important to recognize that in the organisation of *De Hoeve* two different types of quality criteria should be distinguished. First, the criteria and standards of the *Environmental Certification Label* system. Second, the specific qualities requirements of regional butchers, covering other aspects than the *Environmental Certification* system. In fact, *De Hoeve* takes these additional quality criteria as point of departure for pig meat production within a strong partnership. Producers, for instance, oblige themselves to sell all their pigs to *De Hoeve* and to specialize on pig production with a certain type, meat percentage and weight that correspond with butcher's demands. To be able to provide meat as fresh as possible, *De Hoeve* made furthermore specific agreements with slaughterhouse *Westfort*. The latter gives priority to its pigs in the slaughtering process, enabled by pig farmers' willingness to contribute to early morning transports from the production locations to the slaughterhouse. *Westfort* contributes in another way to this specific objective by taking the responsibility for the pre-selection of pig carcasses that meet the demands of meat cutter/wholesaler *Hems* and (indirectly) regional butchers.

3.4 Concluding remarks

De Hoeve represents for several reasons a rather exceptional pig chain in the Netherlands. First there is the proactive attempt to counterbalance the loss of integrity of national pig meat production, often also described in terms as a loss of *societal licence* to produce. It took the initiative to develop and implement an *Environmental Certification* system for pig meat production. Second, there is the capacity to commercialize this environmental certified pig meat by interlinking its better environmental performances with additional quality criteria of specific relevance for regional butchers. Third, this has been realized by developing a chain that builds on a strong partnership, as well as transparency and coherency in overall chain management, including an active participation of pig farmers. Taken together this makes *De Hoeve* a rather exceptional case in the national pig meat sector which continues to be dominated by instable chain relations and opportunistic behaviour of pig farmers and other chain partners.

4 Story of *De Hoeve* pig meat chain

4.1 Introduction

In this chapter we will go more into detail in the underlying networks and institutional innovations of *De Hoeve* case. As will be shown, these networks and innovations include different aspects as the recognition of farm based novelties within prevailing environmental regulations, the construction of networks to mobilize public and private support for the development of a certification system for sustainable pig meat production and attempts to develop strategic alliances with chain partners. The emergence of new networks and innovations is at least partly formalized through new organisational agreements, rules and regulations. It will be illustrated that *De Hoeve* pig meat supply chain is in particular driven by two key actors sharing a vision on how to improve sustainability performances of regional pig meat farming. This vision is probably best characterized as a step by step approach to improve sustainability performances, with an active mobilization of societal and institutional support and the development of strategic alliances with chain partnerships based on trial and error and learning by doing.

By continuous interaction with relevant partners the two initiators of *De Hoeve* succeed to develop new coalitions and to improve a range of organisational and technical aspects of regional pig farming. In retrospective we can distinguish at least four different development stages in the overall processes (see figure 4.1). The circles in this figure visualize the closure of a process marked by an important outcome or milestone(s) of different natures (organisational, institutional, technical or material). At the same time it is should be emphasized that in practise the transitions from one development stage to the next is not always that easy distinguishable.

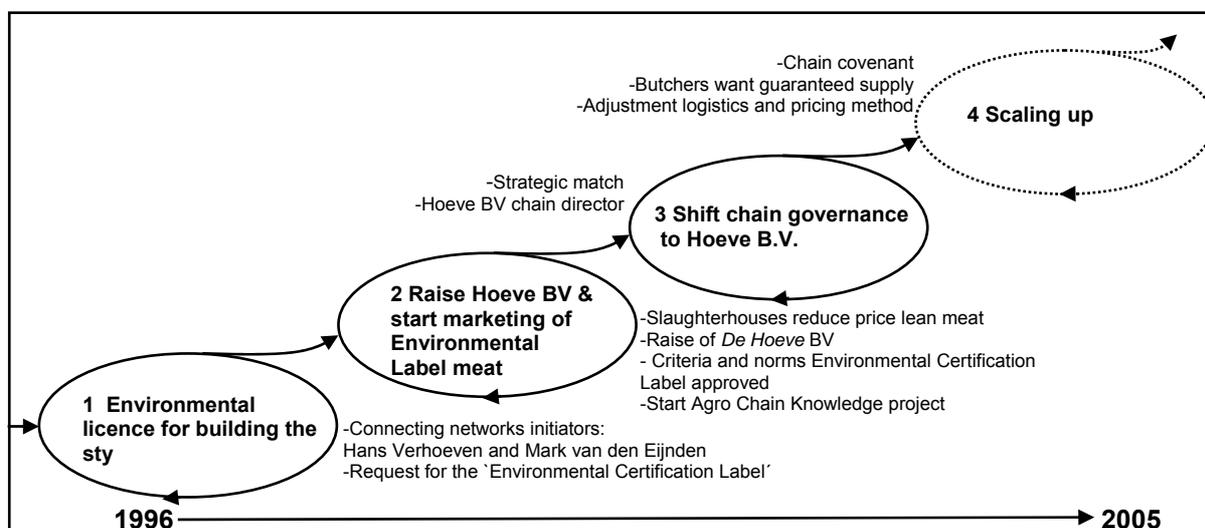


Figure 4.1 Stages of development *De Hoeve* chain and important milestones

The emergence of *De Hoeve* pig meat supply chain goes back towards 1996. Pig farmer *Hans Verhoeven* (who has no agricultural background) needs an environmental licence of the municipality to get a formal permit for his self developed pig sty with a range of technological novelties. During this process *Verhoeven* comes in contact with the second key actor, *Mark van den Eijnden*, an agricultural engineer and owner of a consultancy enterprise engaged in environmental engineering. Together they succeed to get the technological novelties of *Verhoeven's* stable certified by the national *Green Label* system. This stimulates both actors to orient themselves at the development of an *Environmental Certification* system for pig meat. To realize this idea *Verhoeven* and *Van den Eijnden* become business partners

by founding the *De Hoeve bv* (a limited company). After the successful development and implementation of a *Environmental Certification* system for pig meat and a period of trial and error, it becomes steadily clear that the marketing of fresh lean pig meat with an *Environmental Certification Label* to regional members of the association of High Quality Butchers (operating under the *Keurslager* hallmark), matches best with *De Hoeve's* wishes, possibilities and strategic preferences. The commercialization of *De Hoeve* pig meat becomes really substantial when *De Hoeve* takes the lead as 'chain director'. A pilot project in the Province of *Brabant* demonstrates that *De Hoeve* develops into a reliable and viable supplier of *Environmental Certified* pig meat with a growing societal support for its specific approach. The latter is amongst others expressed in a covenant with the pig farmers association, regional governance, environmental organisations and the national *Keurslager* association in which all partners express the need for further up scaling of the initiative. Meanwhile *De Hoeve* also explores other trajectories for up scaling.

4.2 Getting an environmental licence

Verhoeven's attempt to get an environmental licence from the municipality to construct an innovative pig sty underlies the emergence of *De Hoeve* pig meat supply chain (see figure 4.2). In the midst of the nineties *Verhoeven* faces serious problems getting formal recognition for his environmentally, innovative pig sty. This licence is highly relevant to get access to agricultural investment subsidies and to increase production capacity without the necessity to invest in the purchase of extra environmental pollution rights. However, the national *Commission for Testing Sty Emission* concludes that the emission of this sty would still be too high. The commission suggests *Verhoeven*, therefore, to opt for one of the existing stable system that already have an official *Green Label* status, meaning that these stables meet the emission standards. *Verhoeven*, however, is all but convinced that his own sty would be inferior to the ones recommended. He decided to contact the *Pig research station in Rosmalen*. This research station supports his idea that the emission from his sty system will be probably lower than the emission standards of *Green Label*. This strengthens *Verhoeven's* determination to continue with his plans. Through feed supplier *Dommelsche Watermolen* he contacts *Van den Eijnden's* environmental engineering bureau (*Roba*) for technical support. They are confronted with the formal procedures for emission measurements by the national research institute for Mechanisation, Labour and Farm Buildings (*IMAG*). This research institute informs *Verhoeven* that there are no budgets available for alternative stable systems and that measuring his sty system would cost at least 45000 €. With the co-operation of *Van den Einden* and his feed supplier, *Verhoeven* finds a large feed company (*Fransen*) willingly to guarantee the payment of the costs. Later on it turned out that this guarantee was not needed. The *IMAG* had already mobilized extra funding to do the emission measurements in his pig stable. The results of the *IMAG* measurements confirm *Verhoeven's* conviction. The ammonia emission rates are significantly lower than needed for a *Green Label* certification. So, now his innovative sty is officially approved as *Green Label* proof (Klep, 1997).

The innovative sty concept of *Verhoeven* is an accumulation of novelties. It combines lower construction costs with improvements in field of environment, food safety and animal health and welfare. For example, together with the help of a local installer *Verhoeven* creates an ingenious stable heating system using the body warmth of sows in a floor heating system. With this system *Verhoeven's* stable uses only 1 m³ gas per pig place instead of 10 m³ in conventional stable systems. A second example regards the reduction of the grid size needed for flowing down the liquid manure. This adaptation not only reduces construction costs (grids of steel are expensive), but contributes as well to lower emissions as the time manure is in open contact with the air is reduced. At the same time it increases total lying space for pigs resting and eating. Both examples are an illustration for the underlying integral approach of the novelties in *Verhoeven's* new stable system.

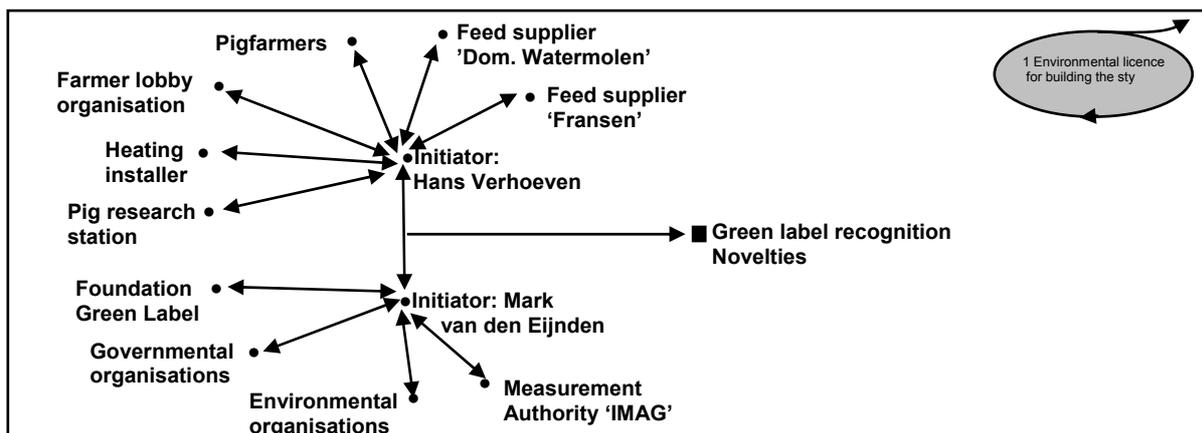


Figure 4.2 Network behind the environmental recognition of Verhoeven's sty

4.3 Founding of De Hoeve and the Environmental Certification of pig meat

During their struggle getting an environmental licence, *Verhoeven* and *Van den Eijnden* get to know each other quite well and conclude that they share the view that regional pig farming should become more transparent and more re-embedded in society. But both also agree on the principle that 'without an acceptable farmers price there is no ecological perspective'. Not only shared views, but also the complementary in personal networks and expertise result in close partnership. *Verhoeven's* network is in particular strong in the primary sector. He is chairing the portfolio 'market' of the regional branch of the national farmer's organisation. *Van den Eijnden* has good relations with environmental organisations and national and regional agencies responsible for the implementation of governmental subsidy programs for sustainable agricultural and rural development.

Without a master plan, both key actors aim for stepwise improvements towards sustainable regional pig farming with changing societal demands and practical applicability as guidelines. After the formal recognition of the stable system within national environmental regulations, the founders of the *De Hoeve* are highly interested in getting an *Environmental Certification Label* for pig meat (see figure 4.3). The Foundation for Environmental Certification (*Stichting Milieukeur*) shows an interest in *De Hoeve's* innovative sty system, but estimates that the development of an *Environmental certification* system for pig farming would cost approximately 40.000 Euro. This need for financial resources is one of the main incentives to create *De Hoeve*, a limited company with *Verhoeven* and *Van de Eijnden* as main shareholders. The *De Dommelsche Watermolen* is also participating initially, but in retrospect this has had little significance. In 2002 this feed supplier is bought out, to avoid a potential conflict of interests and to give *Verhoeven* and *Van de Eijnden* 'carte blanche' in business policy.

The founding of the *De Hoeve* makes business partners of both key actors. This formalization of their relation allows them to mobilize financial support for their ideas. At a period that national slaughterhouses are decreasing their prices for lean meat, *Verhoeven* and *Van de Eijnden* are convinced that underlying motives have more to do with internal problems of slaughterhouses than with market developments. This conviction is an important driving force to think about developing a market niche for *Environmental Certified* lean meat. Therefore they start to contact a regional pig meat trader (*VSE*). This trading company buys living pigs in Belgium and sells meat to a number of butchers in the South of The Netherlands. *VSE* has plans to build a slaughterhouse in Eersel, by coincidence a village close to the location of *Verhoeven's* pig farm. *De Hoeve* and *VSE* start to work close together defining the technical quality specifications for lean meat in *Environmental Certification* system. On a pilot basis they start different experiments that relate to feed, delivery weight, race etc. *VSE* has in particular contacts with supermarket organisations and expects to sell

1750-2000 pigs weekly (Klep, 1997). This scale clearly does not match with the development stage of *De Hoeve*. There are other reasons why this at first sight promising contact fizzles out. VSE does not succeed to get a spatial licence to build the planned slaughterhouse. Moreover, VSE is accused by *De Hoeve* that it is doing business with too many slaughterhouses, abusing market information and playing pig farmers off against each other.

In other words, it is time to look for other partners. In 1997/1998 there is a national debate going on about the future of intensive livestock in The Netherlands and its incapacity to innovate in fields as environment and animal welfare. To demonstrate that regional farmers are serious and active innovating partners, *De Hoeve*, is asked to present its innovative ideas at a congress. At this congress *De Hoeve* comes in contact with *Kooter*, the owner of a wholesale-company. *Kooter* is more than interested in *De Hoeve's* mission and ideas as expressed during the conference. He is convinced that his company depends too much on slaughterhouses and pays, therefore, too much in relation to pig meat quality, which - again in *Kooter's* opinion- would be rather instable. *De Hoeve* could help *Kooter* in his desire to buy quality meat direct from farmers and to decrease his dependency on slaughterhouses. Yet, for reasons that will be explained later, this partnership too turns out to become little enduring.

Meanwhile *De Hoeve* is more successful in its attempts to mobilize financial support for the development of sustainability performance indicators for pig meat under *Environmental Certification Label*. In contrast with food products as vegetables, these indicators are not available yet. The national *Environmental certification* agency estimates the costs for the development of these indicators at 45000€, in particular costs for independent technical research by *CLM*, a private research and consultancy agency specialized in field of agriculture and environment. *De Hoeve* comes to an agreement with the certification agency that it will finance 50% of total costs. It succeeds to co-finance this contribution with other public funds. In particular *Van den Eijnden's* network is in this respect highly helpful. He has close contacts with provincial and national agencies implementing subsidy-programs to stimulate sustainable agricultural and rural development. In 1997 the province of Brabant and Limburg and 3 governmental departments start a subsidy program (*NUBL*) to support territorial policy approaches that integrate the policy fields of spatial planning and environment in Brabant and Limburg. *De Hoeve* succeeds to get a project approved within this regional program. This is used to co-finance the research of the *CLM*. *De Hoeve's* capacity to mobilize financial support is also expressed in project funding from other public and private agencies as the national agricultural bank (*Rabobank project fund*) and the national Board for Cattle and Meat (*PVV*). Later on we will also remind the substantial financial support for the construction of a chain organisation originating from the national research program Agro Chain Knowledge (*AKK project*). At this moment we will limit our self to the conclusion that *De Hoeve* succeeds to get a formal recognition for an *Environmental Certification Label* for pig meat production through establishing a range of partnerships with agencies involved in environmental engineering, environmental policies, pig meat production and national and regional research and subsidy programs.

It is important to emphasize that the process of reaching an agreement about performance indicators for an *Environmental Certification Label* of pig meat is all but simple. The national certification agency frames an extensive procedure (see appendix 1) with the participation of different stakeholders. Formally the performance indicators are proposed by the research institute CLM with an advisory commission having the right to propose adjustments. In this advisory commission environmental organisations, research institutes, the farmers' organisation *ZLTO* and *De Hoeve* participate. Initially the environmental organisations and pig farmers representatives *ZLTO* and *De Hoeve* are diametrically opposed. According to the environmental organisations, organic pig farming is the only acceptable trajectory towards sustainable pig farming. This clearly opposes with the perceptions within the *ZLTO* and *De Hoeve*. *Verhoeven*: 'from the beginning it was clear that pigs with an *Environmental*

Certification Label can not be kept outside as in organic farming for environmental, food safety and economical reasons. After intensive multi- and bilateral sessions and exchange of arguments on the practical impacts of the different perceptions, a list of mutually acceptable performance indicators (see appendix 1) is finally approved in May 1998. These indicators are clearly to be understood as the outcome of a negotiation process. This is illustrated by the fact that they have been adjusted three times in last 5 years.

De Hoeve comes also to an agreement with the national *certification agency* about the required system control. This agreement allows *De Hoeve* to guide pig farmers as well as other chain partners in the transition process towards *Environmental Certification*, including aspects as sty building, genetic material, feed composition and ventilation schemes. *De Hoeve* will provide the certification agency with information on the scheme results in terms of emission reduction and dropout rates in pig production. The certification agency gets the right to control pig farmers performances at randomly. In October 1998 *De Hoeve* becomes officially responsible for the monitoring of the *Environmental Certification Label* for pig meat production. *Verhoeven* as the first pig farmer and *Kooter* as the first wholesaler are then officially certified and get *Environmental Certification Label* on their pig meat.

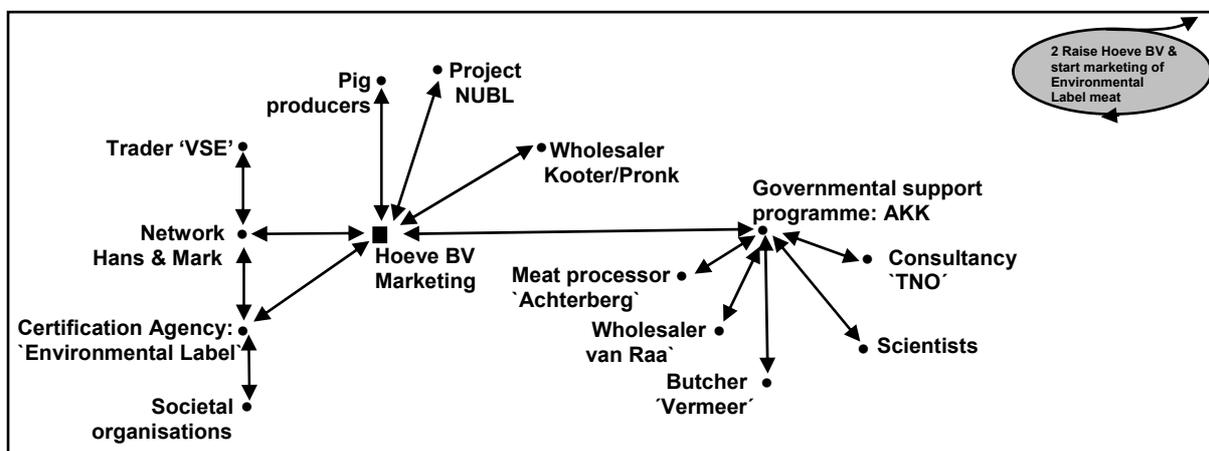


Figure 4.3 *De Hoeve's* network behind the introduction of the *Environmental Certification Label* and the start of the commercialization of its pig meat

From this moment on *De Hoeve* has an important role in monitoring the *Environmental Certification* system for pig meat. *De Hoeve* ambitions go further. They want to support actively the marketing of its meat. For that reason they contacts in 1998 the *Agro Chain Knowledge organisation*), mastering the national programme 'Added Value in Pig meat chains'. This programme offers *De Hoeve* the opportunity to start a three year project with a focus on chain organisation and management (see appendix 2 for the official proposal). In *Verhoeven's* words the project is primarily about: 'In the past years a lot of pig farmers have invested in quality. They are ready for future consumer demands but don't get a better price for their pigs. These pigs are sold in the conventional market. In this project we want to show better environmental results and get better prices. That is possible because the meat meets all the demands of the consumer' (AKK, 2000).

4.4 Shift of chain governance to *De Hoeve*

De Hoeve succeeded to mobilize partners for the development and official approval of an *Environmental Certification* system for pig meat production and to get an important role in the monitoring of the scheme as well as the guidance of pig farmers and other chain partners in required transition processes. But *De Hoeve* initiators wants to enhance commercialization of *Environmental Certified* pig meat as well. *De Hoeve* initiates this process by its *AKK* project in which different chain partners are interested to participate (see figure 4.3). These *AKK*

project partners are looking for different types of strategic alliances, which results in a rather instable network of commercial partners. Just to give an impression: wholesaler *Kooter* shows interest in the overall chain management of pig meat with an *Environmental Certification Label*. Wholesaler *Van Raa*, processor and trader of meat for aircraft meals and owning a number of butcheries, sees opportunities to process environmental friendly pig meat in aircraft meals and to commercialize such a meat at his butcher shops. The industrial meat company *Agterberg* is in particular interested in the processing of pig meat with specific qualities. Butcher *Vermeer* wants primarily high quality pig meat (Van der Schans, 2004).

One of the problems to solve, concerns the issue of chain governance. Wholesaler *Kooter* should take up this role by purchasing living pigs from farmers to reduce costs compared to conventional chains through the exclusion of traders. *Kooter* would become also responsible for paying slaughterhouses for their slaughtering services. Pig farmers, on their turn, would have to pay the transport costs of their pigs to the slaughterhouse. Within this organisation it is important to notice that, unlike conventional pig meat chains, the slaughterhouse is not becoming 'owner' of carcasses. Wholesaler *Kooter* remains the owner, cuts the carcasses into technical parts and sells these to his specific market channels.

However, it becomes clear that this chain organisation is not functioning satisfactory. *Kooter* makes price agreements with *De Hoeve* as well as with individual farmers. This causes confusion and distrust among pig farmers. *De Hoeve* does not like a role of 'watchdog' in this conflict and suggests therefore raising an association of pig farmers, which is founded in 2002. This association allows *De Hoeve* to make agreements on price, deliveries, etc. with the board of the association instead of individual producers. It strengthens its position in overall chain control, which is also legitimized by pointing at positive side-effects in terms of a reduction of coordination costs.

Yet, the chain organisation remains instable due to a mismatch in strategic preferences. Most customers of wholesaler *Kooter*, for instance, turn out to prefer meat that does not fit with *De Hoeve's* search for fresh meat markets with potential of extra added value. Also the idea of wholesaler *Van Raa* to use the meat as ingredient in aircraft meals turns out to be air balloon. *Van Raa* switches its attention to the provision of cheap meals with much more anonymous meat ingredients. *Van Raa's* plans to deliver his butcheries with fresh meat are also cancelled, this time by referring to butcher internal problems. Industrial meat company *Agterberg*, planning to purchase meat for processing purposes, loses interest if it realizes that it will have to invest in the creation of separated process lines between conventional and certified pig meat according to the *Environmental Certification Label* regulations. Butcher *Van der Meer* unhooks as a consequence of unsatisfactory deliverances. He gets frozen meat instead of the demand for fresh meat!

Hagelaar (in: Van der Schans, 2004) summarizes the situation in 2000 as follows: *'it becomes clear that long term cooperation, needed for commercial flow of Environmental Certification Label meat, is difficult because current chain partners are coordinating their activities (buying, selling, processing) on the spot market. This means weekly negotiating with different partners on delivery, price and quality. Besides, there is limited agreement between the partners of how the Environmental Certification Label pig meat concept has to be worked out in practice. Finally, the chain partners are keeping existing relations and are finding it difficult to bother them with a new concept.'*

De Hoeve themselves adds to previous barriers to a successful commercialization of *Environmental Certification Label* pig meat, the sometimes problematic interrelations with research institutes. During the start up of the chain organisation in 1999, the Dutch national research institute for applied natural sciences (*TNO*), is involved in the *AKK project* with the specific task to integrate food safety criteria and norms in the performance indicators for the *Environmental Certification* system. *De Hoeve* aims to get an exception on national

obligatory environmental regulations by providing its own watertight control system. This with the objective to save control costs, but it might also allow *De Hoeve* to create its own defence in times of national food safety crises. In addition an independent control system might be also beneficial to create room for manoeuvre for agricultural entrepreneurship. Verhoeven: 'for the decrease of emissions and manure the government focuses on a reduction of the number of pigs, but different sty systems and different type of feed can also lead to the same or better effects and stimulate entrepreneurship'.

The co-operation with TNO, however, turns out to be little successful. *Van den Einden*: 'In our approach a transition process should be set-out in broad lines, the process has to concretise it. This is the opposite of the TNO approach where everything must be known on beforehand. Why do you need a project then? According to TNO our trial and error approach was not scientific enough'. In short, it turns out that it requires too much efforts and energy to mobilize policy and research support for getting a specific status within national set of environmental regulations. *De Hoeve* decides, therefore, to postpone these ideas and to perceive the overlap between both regulation systems and the involved additional controlling costs as perhaps difficult to accept but at the same time as a problem that is even more difficult to change.

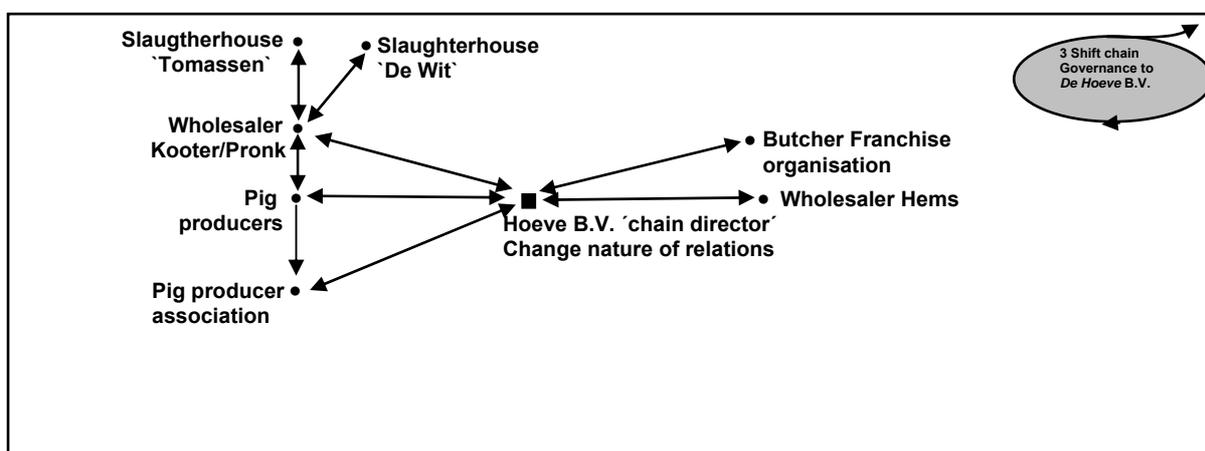


Figure 4.4 The network of *De Hoeve* as chain director

The perspectives for a successful commercialization of *Environmental Certification Label* pig meat improve when *De Hoeve* comes into contact with the national association for High Quality Butchers (*Keurslager*). This franchise organisation has a total number of 560 associates in The Netherlands. During a presentation for recommended suppliers of these *Keurslager* butchers, *De Hoeve* meets wholesaler *Hems*. The latter is clearly interested in *De Hoeve*'s initiatives and has also the advantage of being from the region. This becomes the start of a close cooperation between *De Hoeve*, wholesaler *Hems* and the *Keurslager* association. *De Hoeve* comes to an agreement with its management board to initiate a pilot experiment with the participation of a small group of *Keurslager* butchers. This time partners seem to have more potential for a strategic match. Wholesaler *Hems* delivers to regional *Keurslager* butchers and foresees that cooperation with *De Hoeve* can strengthen his position as recommended supplier. For regional *Keurslager* butchers the *Environmental Certification Label* is perceived as an interesting 'safety bag' to be integrated in its own meat quality standards.

Based on its previous experiences, *De Hoeve* realizes that an important success factor of this new opportunity will be the issue of chain governance. It considers itself as the most appropriate candidate to take this role given its good relations with the pig farmers association and its growing experience with the organisational aspects of pig meat chains. In

short, *De Hoeve* is convinced that the time has come to take over the role of chain director from wholesaler *Kooter* (see figure 4.4).

4.5 Establishing close chain relations and up scaling initiatives

From that moment *De Hoeve* itself is the principle responsible for the commercialization of *Environmental Certification Label* pig meat with regional *Keurslager* butchers as market outlet. Eight of these regional butchers show initially an explicit interest to join an experiment with *De Hoeve*. These are invited on the pig farm of *Verhoeven*; which results in an intensive exchange of knowledge and experiences between the separated worlds of pig meat production and commercialization at butcher shops. It becomes clear that *De Hoeve* pig farmers and regional High Quality Butchers share similar visions on sustainable entrepreneurship. In 2001 this results in the launch of a joint promotion campaign, including articles in regional newspapers and flyers for butcher shops. *De Hoeve* pig producers place a promotion sign with the *Keurslager* hallmark on their farm yard; and consumers are invited to visit their farms. The campaign contributes to a more intensive consumer involvement and stimulates other regional butchers to join the experiment. This will result at the end in a total number of 16 *Keurslager* butchers that start to sell *Environmental Certification Label* pig meat.

In the new situation *De Hoeve* has the responsibility for the purchase of pigs and the negotiations with slaughterhouse *Tomassen* about slaughtering costs. Wholesaler *Hems* orders carcasses by *De Hoeve* with a minimum meat percentage. This means that *Hems* gets initially also pigs with relatively high fat percentages which are more difficult to commercialize to regional butchers. Later on we will see how *De Hoeve* decides to adapt its initial pricing system to counterbalance this specific problem. The fact that slaughterhouse *Tomassen* is not willing to commercialize pigs that do not meet the minimum meat percentages, means that *De Hoeve* needs to find other market outlets for these pigs. It succeeds to sell these pigs to a slaughterhouse that does integrate meat cutting and wholesaling. This slaughterhouse *De Wit* sells these carcasses into conventional chains.

However, the combination of two processing locations goes along with relatively high logistical costs and causes also problems that relate to the fulfilling prevailing hygienic regulations. This decides *De Hoeve* to change in 2002 towards the large scale *Dumeco* slaughterhouse in Weert. In this change *De Hoeve* has to accept that *Dumeco* is not willing to adjust its paying system to its specific demands. *Dumeco* refuses to consider slaughtering as a 'separate' activity and claims its normal margin between slaughtering and wholesaling. As a consequence, this obliges *De Hoeve* to sell its pigs to *Dumeco* and purchase afterwards the carcasses ordered by *Hems*. At the same time and in contrast with the earlier situation, this brings the advantage that it allows for a better selection of carcasses in line with specific demands of butchers. The rest of the carcasses are again sold in conventional market outlets, this time by the *Dumeco* slaughterhouse.

The pricing system of *De Hoeve* builds initially on the dominant system in conventional pig meat sector. This means that *De Hoeve* pays pig farmers the weekly spot market price plus a premium (0.04€) for meeting the *Environmental Certification Label* criteria. All carcasses get a premium that builds primarily on costs savings by chain shortening and other chain efficiency improvements. It is important to notice that regional *Keurslager* butchers are not paying any significant premium price for *Environmental Certification Label* pig meat. At the end 2001 the national pig meat sector is confronted with strong price fluctuations. Weekly prices might fluctuate with 0.07€ per kg slaughter weight. Obviously this situation inclines pig farmers to keep pigs when prices are increasing. Yet, to be reliable partners in a chain concept, farmers should be willingly to deliver at short terms at times when prices are increasing. *De Hoeve* decides, therefore, to develop and implement an alternative price system based on a 13 weeks average spot market price. This means that price fluctuations

that can reach 0.13€ per kg slaughtering weight from one week to another are reduced to fluctuation of no more than 0.01€.

Meanwhile *De Hoeve* is furthermore involved in different initiatives that can be summarized as scaling up (see figure 4.5). In March 2002, for instance, its signs a covenant together with its pig farmers association, wholesaler *Hems*, slaughterhouse *Dumeco*, the *Keurslager* association and regional environmental organisations (www.agriholland.nl 18/03/02). In this covenant all partners express their intention to contribute to the further scaling up of *Environmental Certification Label* pig meat. In particular the participation of environmental organisations is an important signal of the growing societal support for *De Hoeve's* stepwise approach. Until then the same environmental organisations showed little enthusiasm for its initiative and continued to express a clear preference for organic pig production in national and regional media. The gradually improving relations between *De Hoeve* and environmental organisations is in 2003 also expressed in the start of the so called E-light project with the Foundation for Nature and Environment (*Stichting Natuur & Milieu*). This project focuses in particular on the further reduction of CO₂ emissions in *Environmental Certification Label* pig meat production.

In 2003 *De Hoeve* starts another project, this time with financial support from the province of North Brabant and with an explicit reference to knowledge development and dissemination for scaling up. The project mentions an explicit target for scaling up from actual monthly 1200 carcasses towards 5000 carcasses in a time period of 5 years (*Agrarisch Dagblad*, 09/10/03). An important support for scaling up comes also from the director of the national *Keurslager* association. He announces: *'It is not in the interest of our butchers if they have to change to other pig meat as a consequence of a lack of supply of Environmental Certification Label meat with the right quality. If this would be available in sufficient quantities our association could exert this meat to our members'*. Although the association lacks formally the power to oblige its members to purchase *Environmental Certification Label* pig meat, *De Hoeve* understands this public announcement as a clear incentive to start with recruiting new pig farmers to enable an increase of its future production volumes.

But also organisational aspects require continuous attention. In February 2004, for instance, slaughterhouse *Dumeco* decides to end its contract with *De Hoeve*. Officially *Dumeco* declares that the production volumes of *Environmental Certification Label* pig meat do not match with its company policy focussed on large scale volumes (www.agriholland.nl 18/02/04). Whatever other reasons *Dumeco* might have had, this situation forces *De Hoeve* to search for another slaughterhouse. It succeeds to interest mid-size slaughterhouse *Westfort* for this task and to combine the obligatory switch with the implementation of some relevant organisational improvements. For instance, *Westfort* does allow *De Hoeve* to pay for slaughtering as a separate activity, which means an extra trading margin. Another improvement concerns the synchronization of the financial administration between chain partners to realize cost reductions. This allows for a reduction of the number of invoices for pig farmers to only one instead of the four invoices during the *Dumeco* period (costs 2.5 Euro per invoice).

A second change relates to a further adaptation of *De Hoeve's* price-system. As stated, wholesaler *Hems* is most interested in carcasses with a high meat percentage (lean meat). These carcasses are having a better meat cutting efficiency (lesser fat, more meat) and *Hems* is willing to pay *De Hoeve* a premium price for these specific qualities. *De Hoeve* decides to stimulate pig farmers with a direct price incentive if they are able to meet the specific quality criteria of *Hems*. From then on pig farmers can steer on these quality requirements by adapting their breeding preferences as well as feeding schedules.

The switch towards slaughterhouse *Westfort* opens also the way for a number of logistical improvements. Actually about 50% of the delivered pigs are meeting the specific quality

criteria of wholesaler *Hems*, which implies that when *Hems* orders 100 carcasses *De Hoeve* will have to slaughter at least 200 pigs. It is agreed that *Westfort* takes the responsibility for the selection on quality of carcasses and that it also takes care of the commercialization of the rest of the carcasses in conventional chains. *Westfort* furthermore gives priority to *De Hoeve* pigs in its slaughtering planning to facilitate wholesaler *Hems*. This makes it possible to reduce the time period between slaughtering and deliverance at butcher shops with 24 hour. So, the *Keurslager* butchers get fresher meat and are saving costs through minimizing 'out of date' losses. Pig farmers also contribute to this specific service to butchers by accepting that pig transport to the slaughterhouse might start at 2.00 am.

Meanwhile *De Hoeve* is also in search for potential new partners and alliances that might contribute to scaling up. High Quality Butchers in other regions are interested to join the project and there are serious plans to expand the initiative. Another potential for scaling up might be the integration with the *Porc d'Or* initiative. This initiative from the largest Dutch meat company focuses on high quality meat with also butcher shops as principle market outlet. *De Hoeve* reflects upon the idea how this *Porc d'Or* initiative might integrate *Environmental Certification Label* criteria to improve its sustainable performances.

In other scaling up attempts *De Hoeve* is looking for potential outlets at supermarkets, in particular supermarket chains that opt for a regional identity. For that reasons it is also establishing contacts with *SPN*, the national certification agency for regional typical products. *De Hoeve* realizes that getting access to these supermarket outlets might also depend on its capacity to include more regional specific quality criteria in its current pig meat assortment. It also recently established contacts with *Vita*, a Belgian mid-size meat improver, which is to be understood as another attempt to search for new strategic partners that might support up scaling initiatives. This contact is perceived of particular interest with regard to potential market opportunities to process and commercialize the more exclusive pig meat components (hams, etc.)

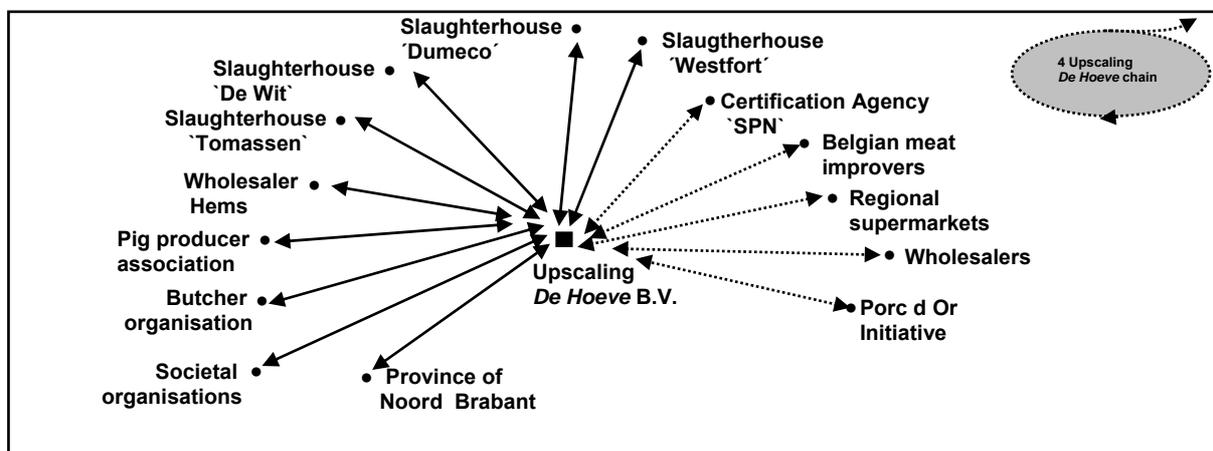


Figure 4.5 *De Hoeve's* network behind the formalization of chain relations and scaling up initiatives

4.6 Synthesis

- *The Environmental Certified* pig meat supply chain of *De Hoeve* traces back to the struggle of pig farmer *Verhoeven* to get an official recognition within prevailing environmental regulations for his also in terms of sustainability performances innovative sty system. In particular the joining of his network with that of other key-actor *Van den Einden*, an environmental engineer with a strongly complementary network, has been of great influence in the emergence of *Environmental Certification Label* pig meat by *De Hoeve*.
- After official recognition for a *Green Label*, the two key actors formalized their shared views on how to work on sustainable regional pig farming through the founding of *De Hoeve*. This limited company becomes a strong driving force behind the development of *Environmental Certification* system for pig meat. Its underlying sustainability indicators are to be understood as the outcome of a complex process of communication, learning and negotiation with stakeholders as governmental environmental bodies, environmental organisations, research institutions, pig farmers and other chain partners. During this processes *De Hoeve* shows its capacity to mobilize and manage an extensive network of public and private stakeholders.
- The *De Hoeve* case illustrates that the development of an *Environmental Certification Label* for pig meat, based on public and societal support, is all but a guarantee for commercial success. This is at least partly to be explained by a clear lack of strategic matches between initial chain partners. This situation changes when *De Hoeve* succeeds to interest the national association for High Quality Butchers (*Keurslager*) for the initiative and when *De Hoeve* takes the lead as chain director. This is the take off for the development of a transparent chain organisation. It is not sustainability performance indicators that are guiding, but a demand led regional pig meat supply chain.
- Under direction of the *De Hoeve*, and by means of trial and error, a stable, balanced and transparent supply chain for *Environmental Certified* pig meat is established. This includes amongst others the introduction of an alternative pricing system, avoiding opportunistic behaviour of pig farmers and other chain partners, and price incentives for pig farmers that most adequately respond to specific quality requirements of regional butchers. In general the management by *De Hoeve* is characterized by its capacity to combine cost reductions through higher chain efficiency with a strong focus on improving the technical quality of its pig meat in line with requirement of butchers. This mounts in a food supply chain where consumers do not pay a premium price for improved sustainability performances. These specific qualities requirements are integrated in the overall *Keurslager* hall mark pig meat quality standards.
- *De Hoeve* case shows that it's scaling up initiatives include different trajectories. Such as the mobilization of extra market outlets through the *Keurslager* association, a search for new market outlets at supermarkets aiming at regional profiles, as well as the development of more profound linkages between current meat quality standards and regional origin and identity. To what extent these trajectories might become successful is difficult to foresee and will depend strongly on capacity of *De Hoeve* to mobilize once more institutional support from governmental bodies, societal organisations, research institutions and in particular, as shown in this section, to create strategic alliances with chain partners.

5. Organisation and performances

5.1 Introduction

Dutch conventional pig meat production is dominated by cost price reduction as principle co-ordination mechanism, the dominance of instable chain relations and the limited coherency in overall chain management (Section 2). Taken together these characteristics have been identified as major reasons for a loss of legitimation and integrity and loss of a 'societal licence' to produce of the pig sector. In section 3 and 4 the emergence and character of *De Hove* has been extensively described. This section provides a more in depth reflection on the organisational characteristics of *De Hove* and its sustainability performances. This will be done in a comparative way. The specific features of *De Hove* are compared with Dutch conventional meat chains, Dutch organic pig meat production as well as different interesting examples of pig meat chain initiatives abroad (*satellite cases*).

5.2 Transparency in chain organisation

De Hove succeeded to construct a transparent chain organisation in terms of establishing new strategic alliances and its interrelated distribution of costs and benefits. Butchers get access to pig meat with additional qualities without a higher purchasing and consumer price, the position of recommended suppliers of *Keurslager* butchers is strengthened, the occupancy rate of the slaughterhouse is increased and pig farmers are getting a better price. This through a shared *responsibility* regarding the flow of pig meat as well as information, knowledge and experiences flows. All partners agreed to provide transparency in their business performances to create a supportive environment for further chain improvements and to respond adequately to market developments.

Grounded on a more balanced decision making process

It has been illustrated that in conventional pig meat chains decision making power is concentrated downstream the chain with supermarkets and large vertical integrated slaughterhouses as highly dominant players. *De Hove* chain is much more based on the search for a more balanced decision making processes between chain partners building on keywords as trust, strategic alliances, chain stability and shared risks. Changes in the chain organisation are proposed by *De Hove* that needs to convince its partners based on its management capacities in terms of chain expertise, network building, and the mobilization of societal support.

A stable and stimulating price system for producers

De Hove developed an alternative price system to overcome the major limitations of the dominant spot market system in conventional pig meat chains. Its price system offers pig farmers more certainties, opposes opportunistic behaviour and creates more stability in production volumes. Pig farmers are stimulated to produce according to the specific demands of *Keurslager* butchers. At the same time it should be stressed that its price system continues to depend on the developments in conventional chains, also because of the fact that *De Hove* requires a conventional bypass for 50% of its pigs that do not meet the demands of the *Keurslager* butchers. This dependency on price developments in industrial and globalizing export markets makes *De Hove* rather vulnerable (Van der Schans, 2004). In this respect *De Hove* has opted for a clearly different approach than, for instance, the national organic pig meat chain

Box 1: The cost price plus system in organic pig meat production (Platform Biologica, 2001a/b; www.agriholland.nl 09/01/04)

In 2001 organic pig farmers, the slaughterhouse *De Groene Weg* and retailer *Albert Heijn* agreed about a three year steady price for organic meat based on the average cost price in organic pig meat production as accounted by an independent organisation. This system stimulates farmers to convert to organic farming and offers organic pig farmers more income certainties. In marketing terms, however, this system turns out to be little successful. In January 2004 retailer *Albert Heijn* announced that the national production volume of organic pig meat had to be reduced because of a significant over-supply.

5.3 Step by step improvements of environmental performance

De Hoeve has been characterized as a *step by step approach* in which ‘the route’ to sustainable pig farming is perceived as an ongoing process to re-balance prevailing interrelations between the economic, social and environmental dimensions of sustainability. With this approach some significant improvements in environmental performance are realized. Figure 5.1 illustrates that *De Hoeve* pig farmers realize lower ammonia emissions (a reduction of 25%) and lower productions of nitrogen (-19%) and phosphate (-18%) compared to the sector average. In addition to these issue specific indicators *De Hoeve* developed a more complex overall indicator to assess its contribution to global heating effects. This overall indicator shows a more modest environmental performance with a 7% lower contribution than pig farmers in the conventional sector, in particular through a better feed conversion (less feed per kg growth results in less CO₂ emissions); and less energy inputs (Milieukeur, 2003a).

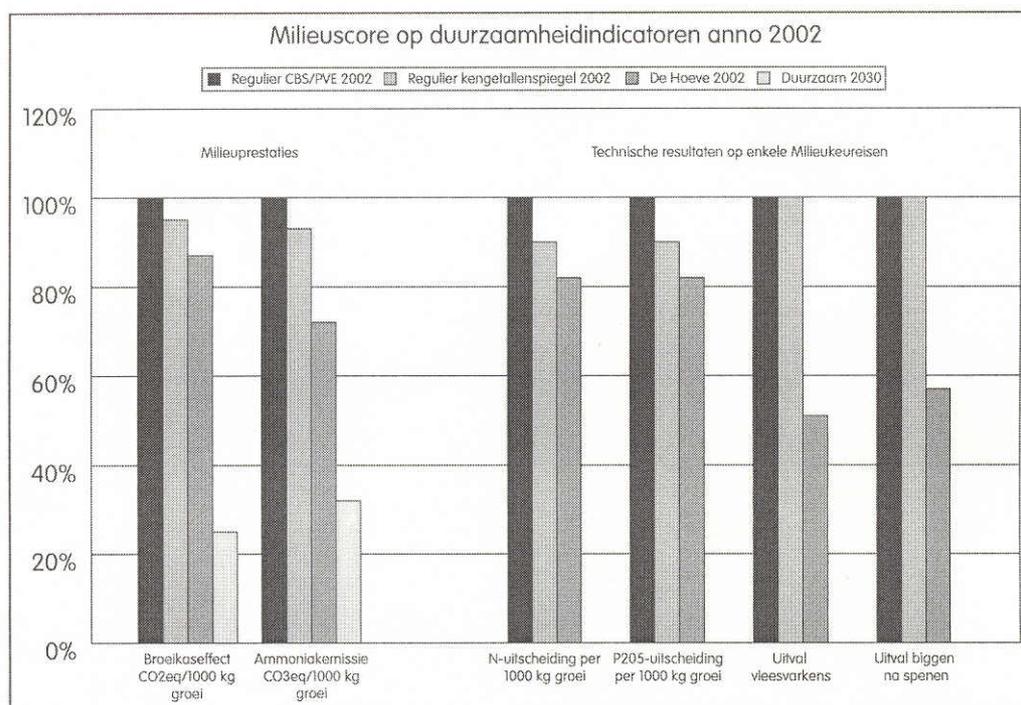


Figure 5.1 Performances *De Hoeve* on environmental sustainability indicators 2002 (Source: Milieukeur 2003a)

De Hoeve aims to improve its environmental performances through technical and organisational solutions that will contribute to a further decrease of methane emissions, the reduction of the use of chemical fertilisers by improved pig manure, and a reduction of CO₂ emissions through a more regional delivery of pig feed components.

Animal welfare

Actual complex interrelations between relevant environmental performance indicators for pig farming is in particular expressed in the tensions between the need for ammonia emission reduction and societal demands for more animal welfare friendly production systems. *De Hoeve* performs particularly well on emission reduction and the control of animal diseases. Its specific attention to animal welfare includes an obligatory use of daylight, the availability of unlimited drinking water and the availability of a separate sick bay, the introduction of toys for entertainment and recent experiment with raw sprinkling on the sty floor to stimulate natural behaviour (scratching in the sty). National organic pig farmers, however, will argue that their production systems are much more animal friendly in terms of allowance for natural behaviour. The issue of animal welfare attracts a lot of societal attention with a growing recognition of the trade off between material interests of pig farmers, industry, consumers, environment and animal welfare (RLG, 2001). The letter is now a day's mostly characterized by the following list of freedoms:

- 1 Free of thirst, hunger and underfeeding
- 2 Free of physical and physiological inconvenience
- 3 Free of pain, wounds and illness
- 4 Free of fear and chronic stress
- 5 Free to show natural behaviour

De Hoeve profiles itself mostly around freedoms that can be integrated with better economic results. For example, it emphasizes its positive scores on animal welfare indicators as drop out rates of pigs and the absence of organ deviations. According initiator Hans Verhoeven in 2002 less than 2% of *De Hoeve* pigs had a lung of liver deviation. *De Hoeve* had furthermore a 50% lower drop out rate of meat pigs and \pm 40% lower drop out rate of piglets after wean in comparison to the conventional sector average (Milieukeur, 2003a). It stresses that also organic pig meat production has somewhat higher drop out rates of meat pigs than its own food chain (4.9% versus <1.8%; Kampshof, 2003; Milieukeur 2004 ;).

Yet, *De Hoeve* might be rather selective with regard to its comparison of animal welfare performances with organic pig meat production methods. This goes in particular for its limited attention for the freedom of natural behaviour. More far reaching adaptations of its stable systems, such as the obligatory free range system in organic pig meat production, are perceived as too costly. Eric van Helvoort (quoted in: Vossen, 2004) chairman of *De Hoeve* pig producers association expresses: *'keeping pigs outside is unrealistic in the Netherlands. It costs too much space and too much money. We will have to control cost price developments because only idealists are buying expensive meat'*. In this respect it is also emphasized that the organic production system is little efficient in terms of growth rates and feed conversion which would result in higher CO₂ emissions in comparison to *De Hoeve* chain. This illustrates again the complex interrelations between different environmental performance indicators. Another expression of this complexity concerns the most relevance point of reference. Emission performances, for instance, can be expressed in terms of kg slaughtering weight (best performances with intensive production systems) or based on m² pigs place (best performances in extensive production systems as organic farming).

Food safety

With regard to food safety *De Hoeve* builds primarily on sector regulations such as the national *IKB* certification system. Also the purchase of feed from a GMP⁺ recognised food supplier which guarantees the absence of preventive use of antibiotics in pig feed is of relevance. Good Manufacturing Plus (GMP+) builds on the ISO 9000 and HACCP logics as applied in food industries. The system guarantees tracking and tracing and feed samples are frequently researched in laboratory (LTO, 2004). Recent food scandals (dioxin, MPA) in national pig production, however, show that animal feed continuous to be a weak link in actual food safety control systems. Strong economic interests in combination with a little

transparent structure of the feed supply sector result in repeating scandals; also because the fact that the risks of being caught and sanctioned are still rather limited. Solutions should come from even more severe control systems (GMP+). Environmental organisations are not convinced that these systems indeed can exclude future scandals and advocate more regional origins of pig feed components (Milieu Defensie, 2003). Mainly for economic reasons, *De Hoeve*, however, has little confidence in this alternative trajectory to reduce food safety risks.

Some concluding remarks:

- *De Hoeve's* environmental performance indicators demonstrate a step by step approach with some clear progress in comparison to conventional chains. It has been also shown that environmental performance indicators are subject of societal debate and that different production systems claim relatively good performances with regard to emission reduction, animal welfare and animal health.
- *De Hoeve's* performances are most positive in terms of emission and energy reduction. In particular for these environmental issues *De Hoeve* can be seen as an incubator for experiments to improve environmental performances in pig meat production. With its focus on a step by step approach without high investments it claims to have a more significant impact on overall environmental performances of the national pig meat sector than, for instance, the organic pig meat production. Not only by pointing at much higher investments and production costs of organic pig meat production, but also at the ongoing societal debate on the superiority of the environmental performances of organic farming.

5.4 Extra value added based on cost reduction and redistribution

With regard to the economic dimension of sustainability *De Hoeve* aims above all at the creation of extra value added through better technical performances and chain efficiency. Without significant higher consumer prices, total added value of *De Hoeve* supply chain will be comparable to the added value realized within conventional pig meat chains. However, by means of chain shortening and cost-reduction (higher cutting efficiency, decrease of losses) *De Hoeve* succeeds to create extra net value added, that is redistribute between all chain partners, with significant benefits for pig producers as well. In this respect it is relevant to refer to recent research findings that conclude that national pig meat prices for producers might increase with 0.05€ per kg slaughtering weight with a better chain organisation (Bondt *et al.* 2005). Actual premium price per kg slaughtering weight of *De Hoeve* pig meat is 0.04 € plus additional payments for farmers that most successfully succeed to meet butchers quality criteria. Based on available information this results in a total estimated extra value added for an average *De Hoeve* pig farmer of 10.000 € per year, without taken into consideration the possible extra costs.

It is furthermore important to emphasize that *De Hoeve's* creation of extra net value added in the chain and the contribution to the maintenance of rural employment is probably most significant at regional level. Due to the involvement of and dependency on regional operating chain partners (butchers, meat cutter, etc.). Hence, from a regional perspective *De Hoeve* has also positive multiplier-effects in terms of maintaining rural employment.

5.5 Less attention for alternative approaches to create extra value added

De Hoeve's current strategy is strongly based on the marketing of lean pig meat. Its experiences show that in this market segment it turns out to be quite difficult to realize a premium price for its better environmental performances. *Keurslager* butchers sell *De Hoeve* meat unpacked and anonymous to consumers without much interest to promote it actively. They prefer to integrate the additional qualities in their own shop brand name (Smit quoted

in: van der Schans, 2004). For butchers it is probably also more effective to promote the positive claims of the *Keurslager* hallmark regarding meat qualities and client services than often more negative consumers' associations around specific environmental claims. In other words, *De Hoeve* meat is above all relevant in business to business markets. Or, in words of Antoine Baars, vice president of the High Quality Butcher association: 'We see the *Environmental Certification Label pig meat guarantees primarily as an extra airbag in times of food crises*'.

The limited successes of *De Hoeve* to communicate its specific pig meat qualities directly to consumers can be also explained by the absence of a national tradition of specific market niches for *fresh pig meat* (see also box 2).

Box 2: Value added creation in fresh meat market in the Netherlands

Value added creation in pig meat production is strongly dominated by 'end of chain differentiation'. In this model pig farmers are easy exchangeable suppliers of meat with highly standardized qualities. The added value of this standardized production is primarily created in the end of the chain by food technology, for instance by tailor made, pre packed, easy to prepare fresh meat (meals) for supermarkets. Producer quality labels could be supportive to strengthen consumer loyalty, however in particular in fresh meat markets such labels continue to be almost completely absent in the Netherlands. This also expressed in the fact that the largest national retailer *Albert Heijn* ended in 2004 the use of the *IKB Certification label* (www.agriholland 15/09/04). In particular large retailers continue to prefer the purchase of pig meat from anonymous providers against low prices.

In this respect it is of specific interest to see that, for instance, in Germany there exist several farmer driven initiatives that do succeed to create extra value added by the development of fresh meat market niches with distinctive qualities under own brand names.

Box 3: Producer labels in the fresh meat market in Germany

The *Bauerliche Erzeugergemeinschaft 'Schwabisch Hall'* (BESH) concerns a small scale farmer's initiative in the German region *Hohenlohe* that commercializes fresh pig meat with its own regional label to butchers and restaurants (www.besh.de). BESH claims that its meat has a distinctive taste because of: the use of traditional breeds, protein rich diets by using beans and stress reduction through own transport and specific slaughtering methods. It also profiles its meat by its animal friendliness (free range), the regional origin of feed components and the lower food safety risks. This makes involved producers clearly less exchangeable than in conventional pig meat chains.

BESH is furthermore a nice example of chain-shortening by producers. These are shareholders of the municipal slaughterhouse and responsible for processing, packaging and commercialization of the meat. The producers are also involved in partnerships to commercialize the pig meat under other consumer labels (*Du darfst*, *Ecoland*). In 2004 BESH succeeded in this way to commercialize 1000 pigs a week (*Haller Tagblad* 09/06/04). The *Swäbisch Hällisches Qualitätsschweinefleisch* label is promoted on consumer events, free publicity and by mobilising societal support. Its success is also explained by the fact that regional butchers and restaurants actively profile themselves with its specific qualities.

Neuland is a certification organisation wherein Pig farmer organisations, societal organisations and governmental organisations are participating (www.neuland-fleisch.de). The *Neuland* hallmark is focussing on severe animal welfare performances and creating perspectives for family owned companies. Small regional farmer led cooperatives are selling pig meat with the *Neuland* hallmark to butchers and restaurants that actively promote the *Neuland* hallmark. *Neuland's* distinctive production characteristics show a lot of similarities with the *Swabisch Hallisch* initiative. Involved pig farmers participate in a regional marketing organisation and are the owners of involved meat cutting /wholesale enterprises. The *Neuland* chain commercializes a total of 650 pigs per week from 200-220 small scale producers to regional butchers and out of home market outlets (restaurants, canteens etc). Again, also the success of the *Neuland* hallmark goes at least partly back to the support from societal

organisations. Another success factor is probably the deliberate exclusion of supermarkets as a market outlet, which guarantees butchers and the out of home market a kind of exclusivity.

Value added by distinctive quality dimensions

De Hoeve pays little attention to the creation of extra value added through distinctive qualities as regional specificity. The same goes also includes for and/or more artisan processing techniques. In this respect some Italian pig meat chains offer interesting examples of alternative marketing strategies.

Box 4 Italian Prosciutto

In contrast with The Netherlands, Italy has a tradition of clearly demand driven pig meat chains that include distinctive production related quality criteria. This concerns in particular the production of ham, with the *Consorzio Prosciutto San Daniele* (CPSD) and *Consorzio Prosciutto Parma* as two interesting examples. For producing Prociutto di Parma they need approximately 7.5 million pigs per year for their high quality hams (Buttazoni, 2002). Whereas the scale of pig production within both marketing concepts is rather similar to the Netherlands, there are strong differences in chain characteristics. This concerns in particular the capacity of these consortia to create strong coherency between chain management and marketing strategy. Pig farmers, slaughterhouses, deboners, hamripeners have to follow the strict quality guidelines of the consortium. The position of pig producers in these chains is relatively strong given the requirements with respect to regional origin and regional processing methods. These regional specific qualities are protected from imitation by the European PDO hallmark.

One of the barriers for *De Hoeve* to develop similar food chains concerns the difficulty to find chain partners interested in the development of this type of niche markets (in the Dutch context). As a consequence of natural variation, it can't avoid the production of a significant percentage fatter pigs that do not meet the specific demands of Keurslager butchers. *De Hoeve* is therefore interested to sell these fatter pigs to meat improving companies in search for related distinctive qualities. In the absence of national interested chain partners, *De Hoeve* followed our suggestion to organize some exchange meetings with the Belgian Vita project, a relatively new Belgian pig meat chain which also pays specific attention to production dependent distinctive quality criteria (see box 5).

Box 5 Vita project in Belgium

Vita project is initiated by the small scale Belgian meat improving companies *Ganda Ham* and *Hamboerke* to counterbalance food safety problems (dioxine, antibiotics). Both meat improvers experienced that the ripening process and keeping qualities of the hams were disturbed due to stress factors, the use of antibiotics and the use growth improvers by feed industry and pig farmers. So, their image was at stake. The *Vita* project aimed to restore consumer trust and involvement through the elaboration of a more reliable quality control system. The *Vita* project functions as a chain director that purchases ±500 pigs a week from small scale closed pig farms and commercializes pig meat under *Vita* label to butchers and meat improving companies. The label is directly promoted to consumers at butcher shops and on meat product packages. *Vita* quality criteria focus primarily on less food safety risks. For instance, pig food components have to be the whole year the same- regardless the availability of cheaper substitutes- to avoid the use of inferior food components. By coincidence it became clear that the combination of fixed feed components, minor changes in pig farm management (increase of slaughter weight till 115-120 kg) and the slaughtering process had a clear positive effect on the appreciation of the taste of the meat products. These positive effects are now actively used to position *Vita* as a typical regional quality product. Meanwhile *Vita* is also involved in research that might legitimize additional health claims of its meat (building on its high levels of multiple unsaturated fatty acids).

During these meetings the producer of the Belgian *Ganda* hams expressed a first interest in the possibility to process the fatter parts of *De Hoeve* pigs. In particular if *De Hoeve* will pay more attention to the interrelations between meat quality and feeding systems, the producer

foresees marketing opportunities to process these fatter parts into high quality ham to be commercialized in market niches as regional *Keurslager* butchers.

5.6 Mobilization of different types of public support

It has been illustrated that *De Hoeve* mobilised different types of public support for its activities. This starts with the participation of (semi-) governmental bodies, societal organisations and national research institutions in the elaboration of an *Environmental Certification Label* for pig meat production, which included among others the development of performance indicators and the introduction of a monitoring and control system. In general it can be concluded that *De Hoeve* is rather successful in its attempt to mobilize support from national and regional governmental bodies for its active step by step approach to improve the environmental performances of pig production. Relevant support from national governmental bodies refers in the first place to the need for new rules and regulations to get an institutional *legitimation* of its initiative. It has been shown that this process went along with some conflicts with prevailing national set of rules and regulations as demonstrated by *De Hoeve's* unsuccessful attempts to implement a control system that could avoid double administrative checks.

De Hoeve's capacity to mobilize support from environmental and other societal organisations also contributed to the legitimization of its initiatives. Initially environmental organisations showed some clear reluctance in their support given a strong preference for organic production methods. Yet, *De Hoeve* succeeds to convince regional environmental organisations steadily that its step-by-step approach might on the longer run also result in significant improvements of the environmental performances of pig meat production. Its pro-active dialogue with societal organisations, however, did not yet result in a supportive role of environmental organisations in the commercialization of its pig meat. This in contrast with the food chain initiatives presented in the Italian and German satellite cases where societal organisations are taking a much more active role to promote pig meat labels with specific sustainability claims.

De Hoeve has been also rather successful in the mobilization of new *knowledge* and *skills* to support its initiatives. In particular the Wageningen University and Research Centre contributed to the development of relevant environmental performance indicators for pig production. Through the national AKK-project it got access to scientific knowledge on chain management and strategic niche management. Also this support from research institutions has been of importance for *De Hoeve*. It contributed to the development of relevant new knowledge and skills and strengthened the legitimacy of its new food chain. At the same time it has been concluded that the cooperation with national research institutions is sometimes rather problematic. *De Hoeve's* experiences learn that prevailing organisational and financial rules in research institutions might be difficult to match with a preference for step by step and trail and error approaches.

De Hoeve showed furthermore a clear capacity to mobilize financial support for its activities originating from national and regional budgets for rural development and food chain programs. As shown, this includes its capacity to combine different sources for project funding as a response to co-financing requirements.

5.7 Contribution to sustainable rural development

De Hoeve has been characterized as a sustainable food supply chain initiative driven by new strategic alliances between pig farmers and their commercial partners. The initiative has received different types of public support. Furthermore commercial performance has been

assessed as the capacity to create extra value added and extra farm-income. Also strong and weak points of the current marketing strategy were evaluated.

In this paragraph the overall contribution of *De Hoeve* to a sustainable rural development is assessed. The assessment of the performance of *De Hoeve* is relative, i.e. when compared to conventional pig meat supply chains for a range of economic, social and environmental indicators. The results are presented in table 2.

Table 2 Relative performance of *De Hoeve* when compared to the conventional pig meat supply chain for a range of sustainable rural development indicators
(+++ highly positive, ++ rather positive, + positive, 0 neutral, - negative, -- rather negative, --- highly negative)

	Conventional	<i>De Hoeve</i>
Economic indicators		
NVA in region	--	+
Direct, indirect and induced employment in region	--	+
Farmers share in value added	--	+
Transaction costs of establishment chain		--
Transaction costs of maintenance of network		+
Dependence on public support	++	--
Displacements effects within region	--	+
HALO effect on output/jobs within region	--	+
Social indicators		
Self organisational capacity	--	++
Bridging social capital increased	--	++
Learning knowledge increased	---	+++
Enhanced trust/faith in food system	--	+
Enhances social inclusion	+++	++
Yields job satisfaction	---	++
Encourages succession	---	--
Environmental indicators		
Increases biodiversity	---	--
Reduces negative externalities	--	++
Increases positive externalities	---	--
Enhances cultural landscape	--	--
Reduces road miles	--	++

Table 2 illustrates that the overall performance of *De Hoeve* in terms of its contribution to a sustainable rural development is rather modest. The modest performance can be explained as resulting from the particular development strategy of *De Hoeve*: a step by step approach to improve particularly the environmental performance of regional pig meat production.

When regarding the performance in table 2 more in detail, *De Hoeve* has a positive score on economic sustainability indicators. *De Hoeve* initiative creates more NVA in the region, contributes to direct, indirect and induced employment in the region and has enlarged farmers share in value added of the supply chain. This is primarily to be explained by *De Hoeve*'s focus on regional market partners and regional market outlets and its focus on chain efficiency. This modest positive performance, however, has been realized with relative high transaction costs and depended therefore on substantial public support. This has been revealed in previous sections, outlining the complexity of founding *De Hoeve* as an alternative pig meat supply chain.

One can argue that *De Hoeve* scores positive on regional displacement effects and HALO effects. The mainly negative environmental side-effects of large scale pig meat production in conventional supply chains constrains the development of other rural SME's, such as tourism. Furthermore, the co-operation of *De Hoeve* with regional chain partners in particular (slaughterhouses, wholesalers, butchers) results in higher multiplier-effects for rural economy than in the case of a conventional pig meat supply chain depending on national or even foreign chain partners in mainly urban centres (large scale slaughterhouses, large scale retailers, supermarkets, etc.). The positive effect on regional economy should however not be over-estimated, as *De Hoeve* supply chain is still limited in terms of scale or volumes of production and consumption.

The impact of *De Hoeve* is more significant for the social indicators of sustainable rural development. First, an enlarged self organisational capacity of regional pig farmers, primarily focussed on better environmental performance, has been the most important driving force in the emergence and genesis of the alternative supply chain. Second, bridging social capital increased and thus sustained a sustainable rural development. The *Environmental Certification system* could be only realized in close co-operation with societal interest groups, more in particular regional environmental organisations, and policy bodies. The initiative has improved relations between different stakeholders and has contributed to better mutual understanding of possibilities and constraints for improving environmental performances of regional pig meat production. So, if we understand sustainable rural development as an ongoing process of learning and negotiation, *De Hoeve* is clearly to be understood as an example and exception in national pig meat supply chains. Conventional supply chains are still very defensive with respect to their willingness to participate in multiple stakeholders learning processes. This results also in a positive score on job satisfaction. More specifically this refers to the pro-active attitude of *De Hoeve's* pig farmers and their involvement in safeguarding a 'societal license to produce' for national pig farming. This reflects a renewed professional self esteem of pig farmers.

The scores on other social indicators in table 2 are less convincing. Such as the contribution of *De Hoeve* in enlarging consumers trust in food supply chains. Although it might be argued that *De Hoeve* contributes positively to consumers' faith in food systems by means of an *Environmental Certification Label*, it should be acknowledged that this label is hardly known by consumers. The *Environmental Certification Label* primarily functions as a business to business concept and sustains the quality hallmark and image of the *Keurslager* butchers.

The assessment for the social inclusion indicator needs some explanation. Dutch conventional pig meat supply chains are focussed on cost price reduction and low consumer prices. Thus pig meat is rather cheap, especially in supermarkets, and easy accessible for all social classes. Pig meat produced by *De Hoeve* is somewhat more expensive, because it is sold in *Keurslager* butcher shops where consumer prices are on average higher than in supermarkets. But *Keurslager* butchers sell pig meat of the *De Hoeve* at the same price as conventional pig meat. Important is to restore consumer's trust and their willingness to pay a premium price for guaranteed better food quality sold in *Keurslager* shops. This market strategy without doubt increases the (potential) inclusion of consumer groups, but also explains *De Hoeve's* modest impact on other social indicators, such as succession opportunities in pig farming.

Finally, table 2 distinguishes five environmental indicators. *De Hoeve* distinguishes itself most positively from conventional pig meat chains in reducing negative environmental externalities and road miles. This underpins again that *De Hoeve* is primarily to be understood as a farmers' attempt to counterbalance negative environmental side-effects of conventional pig meat supply chains, pursuing a regional approach. At the same time *De Hoeve* does not yet succeed to make a difference with regard to other environmental indicators. With intensive land use and dependency on industrial production systems similar

to conventional supply chains, the impact of *De Hoeve* on biodiversity, cultural landscapes or other examples of positive environmental externalities of agricultural is likewise assessed as negative.

6. Discussion and conclusions

6.1 Central hypothesis

Scaling up an initiative in the field of new food supply chains changes the nature of the (chain) organisation (network structure, rules, values etc) and its sustainability performance.

Regarding the central SUS-CHAIN hypothesis, it is important to notice that *De Hoeve* case shows clear empirical evidence that scaling up (i.e. commercialising a bigger volume of pig meat) of new food supply chain can follow different trajectories.

The first trajectory, a strategy actively pursued by *De Hoeve*, is expanding the volume by mobilising additional *Keurslager* butchers in the region or other regional retailers (e.g. supermarkets). A second trajectory is the development of *supplementary market-niches*, such as the interest expressed by the *De Hoeve* to develop an extra market-niche for processed pig meat (in particular hams). A third trajectory in scaling up production and marketing could be an *imitation* of the particular technical-institutional configuration of the *De Hoeve* pig meat supply chain, based on the *Environmental Certification Label*, in similar initiatives in other regions. A fourth trajectory refers to the vanguard position of *De Hoeve*; the low cost innovations that have improved environmental performances significantly and the cost saving pig meat supply chain management can be well *integrated* in conventional chains. Obviously these different trajectories for scaling up make it rather complicate to speak in general terms about the interrelations between changes in the nature of chain organisation and sustainability performances.

Conclusion 1:

There is not just one way of scaling up a sustainable FSC-initiative. Scaling up of new food supply chains can get different shapes along different trajectories. Each trajectory has its own organisational and commercial features and dynamics, resulting in a different performance profile on sustainability indicators. In terms of their contribution to more sustainable FSC, each trajectory has therefor to be assessed on its own.

6.2 Subhypothesis 1

Scaling up depends on commercial performances and appropriate public support

The relevance of commercial performances

The relevance of commercial performance in relation to new food initiatives is clearly manifested by *De Hoeve*. The initiative started with the idea to develop criteria for an *Environmental Certification Label* for pig meat. This was a pro-active attempt to respond to a diminishing 'societal licence to produce' for regional pig meat production. After a successful elaboration of this label, *De Hoeve* has taking a leading role as chain manager in order to commercialise the *Environmental Certification Label* on its pig meat. Its commercial performances express primarily a strong capacity to build strategic alliances with chain partners interested in the integration in the supply chain of:

- 1) better environmental performances;
- 2) cost saving measures (technical as well as institutional or organisational) and thus higher cost efficiency;
- 3) the provision of technical pig meat qualities in line with the specific demands by regional *Keurslager* butchers.

This has resulted in a clearly demand-led, transparent regional pig meat supply chain with a total value added similar to that of conventional pig meat supply chains. Financial benefits for the involved chain partners come above all from cost-reduction through chain-shortening, chain-efficiencies. The resulting extra net value added is redistributed among participants an

acceptable and stimulating way. In other words, the commercial performance of *De Hoeve* can be understood as a rather successful attempt to overcome some major shortcomings in the organisation of conventional pig meat supply chains, but cost-price reduction has nevertheless remained the overall guiding principle. In improving its commercial performance, *De Hoeve* has only recently expressed an interest in potential market niches with significant premium prices for pig meat, thus increasing the value added of the supply chain. For instance by building on additional farm based pig meat qualities, regional specificity, artisan processing techniques, etc.

Conclusion 2:

Scaling up should not be a goal in itself. In terms of e.g. commercial performance scaling up can even be counterproductive, because of an uneven rise of costs (e.g. for logistics or for administration and control) or a lack of market opportunities. Uncareful scaling up might in some case even destroy the initiative and its potentials. The question is then, what is the most appropriate scale for a sustainable FSC-initiative.

The relevance of public support

De Hoeve received in relevant public support in different ways. First a *legitimation* of the its approach by a successful mobilisation of the support and active participation of (semi-) governmental bodies and societal organisations in the elaboration of an *Environmental Certification Label* for *De Hoeve* pig meat. The elaboration of criteria and standards for *Environmental Certification Label* and the trial and error approach to get pig meat supply chain partners interested were also *financially* supported by national and regional public bodies. A third type of public support refers to the need for adequate *regulations* to formalize, assess and monitor the *Environmental Certification Label* for the pig meat supply chain. Fourthly support in the development of *knowledge* and *skills* have to be mentioned. *De Hoeve* has established good relations with several national research institutes, primarily experts in the field of environmental performances, but also in the management of supply chains.

An important conclusion is that *De Hoeve's* ability to mobilise these different types of public support, depends largely on the skills of one of its initiators as change agent. He has a background in consultancy and has much experience in process management. This is no doubt one of the key factors in the emergence and ongoing scaling up of the *De Hoeve* initiative. In initiatives where this experience lacks, public support for *facilitators* or *process managers* can be highly relevant.

Conclusion 4:

a) Public support can fulfill different functions: financial support, (social-political) legitimation of the initiative, adaption of or change in (public) regulations or enhancing the development and diffusion of knowledge and skills. So, b) policy and public agencies should be keen on using (a combination of) these different supportive functions and sustainable FSC-initiatives should develop the capacity to mobilize (combinations) these different public supports. Intermediaries can play an important role in this.

6.3 Sub hypothesis 2

Nature of organisation changes with scaling up as an effect of growth in market power and of the increased pressure of economic constraints and logics

This sub-hypothesis is less validated by the *De Hoeve* case. From a broader perspective, one could argue, that its organisational dynamics can primarily be understood as an attempt of pig farmers to de-construct the dominant organisational configuration in conventional pig meat supply chains to be able to create a protected space or niche for a reconfiguration of supply chains relations at small scale and in an experimental way (learning by doing, doing by learning). Where the vested supply chain is highly problematical in terms of a lack of

transparency and coherency, dominance of opportunistic behaviour and so (see e.g. ?), the *De Hoeve* supply chain is founded on arrangements that should safeguard trust, transparency, coherency and shared responsibilities. So, initially *De Hoeve* is a case of drastic *downscaling*, seen as a pre-condition to be able to rearrange some fundamental (mainly institutional-organisational) problems within the conventional supply chain. They started from some technical innovations (*novelties*), but from then on they constructed mainly new institutional bits and pieces and connected all of them together in a new technical-institutional configuration (or actor-world), following a step by step approach. The ability to make new connections is a key factor in explaining the successful development of the *De Hoeve* thus far. The *Environmental Certification Label* is as a matter of fact a symbolic acknowledgement of these new established connections. These institutional-organisational dynamics have been described in section 4 in four main phases.

If we focus more on this organisational dynamics, the *De Hoeve* case clearly illustrates that scaling up, i.e. a growth in volume, extension of the network and changes in external relations, ask for or bring about unavoidable internal organisational changes. This has been well acknowledged and anticipated by the leading agents (the former initiators) of the *De Hoeve*. These internal changes are however less directly driven by a growth in marketing power (which is still highly limited) or an increased pressure of economic constraints and logics (which from the start were perceived as guiding principle). The gradual changing role of the *De Hoeve* from initiator and facilitator towards chain director has gone along with significant changes in the new established actor-network, institutional as well as technically. Informal changes or shifts were formalised to some extent later on. Initially the created actor-network was rather instable and loosely structured, but later on it got more stable and robust when relations were formalised (labelling, contracts, and son on). More specifically this occurred when the role of *De Hoeve* shifted to chain director. A successful commercialisation of pig meat asks for a more robust actor-network. This actor-network is currently in a process of further formalization. This is e.g. expressed in the founding of a producers association.

The organisational dynamics within *De Hoeve* supply chain can not be explained by the increased market power of *De Hoeve* or economic constraints. These factors are more relevant in (large chains which already pass trough a process of upscaling (for example the conventional pig meat supply chain). The organisational changes (in: logistics, price method, pig management, chain directorship) within *De Hoeve* supply chain can be better explained as reflecting the capacity of *De Hoeve* to build and maintain a strategic alliance and chain partnership in creating a market niche. Organisational changes are successfully passed through because of *reciprocity*, *trust* and *mutual interests* within the chain partnership (*De Hoeve*, the meatcutter/wholesaler and the *Keurslager* butcher association). These changes are not forced by one of the partners due to unequal market power, but as a result of common interest and negotiation.

Conclusion 5:

Sustainable FSC-initiatives have no or little market power in relation with big market players in vested FSCs. The creation and formalisation of a (new) niche market, a resulting new institutional arrangement (rules, functions and relations), depends most of all on the ability to build a strategic alliance of the initiators with chain-partners, but also public agencies and societal organisations. This strategic alliance should be based on shared ideas and a common vision with respect to the role of sustainable FSC, and more specifically, a common interest and mutual trust between the involved chain partners. These strategic alliances might serve as counterforces to the vested interests of (big) market players and creates space for experimentation and learning.

6.4 Sub hypothesis 3

New FSCs have a positive effect on rural sustainable development

De Hoeve does have a positive impact on sustainable rural development, albeit in many respects a modest one. This holds in particular for its economic performances in terms of the number of involved pig producers, production volumes, extra value added generated as well as market share in comparison to conventional pig meat supply chains. From a regional perspective, the economical impact becomes already more significant. The *De Hoeve* supply chain depends foremost on regional chain actors (meat cutter, slaughterhouses, and butchers). This regionalisation of the supply chain has a multiplier-effect on rural economy, generating for example more rural employment compared to conventional pig meat supply chains, although this is difficult to quantify. Overall, however, the impact of *De Hoeve* on rural economy is marginal. But the pioneering work of the *De Hoeve* supply chain towards regionalisation of the chain is an interesting and challenging example in the desired transition of the Dutch pig sector.

The environmental performance of *De Hoeve* is particularly expressed in a reduction of negative externalities of pig meat production. Most significant contributions are a reduction of ammonia emission, nitrogen losses and energy inputs. Progress in animal welfare, another major concern advocated strongly by environmental and animal welfare organisations in The Netherlands, is however minimal. This is related to the strategy of *De Hoeve*: a step by step, or in this case rather a bit by bit approach instead taking a big leap at once with respect to improving environmental performance. Seen the major societal concerns, further improvement in environmental performance and a significant improvement in animal welfare, will be crucial for *De Hoeve* to maintain substantial societal (and political) support (often referred to a 'societal licence to produce') for their pioneering towards a regionalisation of pig farming. This raises the question what promises the approach of *De Hoeve* still entails with respect to environmental and animal welfare issues.

Another question is whether the regionalisation strategy of *De Hoeve* is the remedy for Dutch pig sector as a whole. As long as 70% of national pig meat production depends on very competitive international market-outlets, chain-shortening and regional market outlets, being two crucial components of *De Hoeve* strategy, will not work at national level. Simply because there too many pigs have to be sold. One can then argue that sustainable pig farming in The Netherlands can only come about with a drastic cut down in production volume.

De Hoeve's contribution to the social dimension of sustainable rural development is most explicitly expressed in its *self regulative capacity* to respond to growing societal concerns around current negative externalities of pig meat production. *De Hoeve's* search for an active dialogue with relevant actors about how to improve the environmental performances of regional pig meat production expresses in another way its capacity of building *social capital*. This dialogue can be also perceived as a kind of *interactive learning community* with the active participation of relevant stakeholders interested in the future of pig meat production.

It is important to note that this interactive learning community is located within rather opposing perspectives regarding a transition towards sustainable pig meat production in The Netherlands. One perspective opts for a family farm based transition, but with profound progress in environmental and animal welfare questions with organic pig farming as ideal. Pig farmer respond to new consumer demands, what will generate extra value added and reduce the drive for scale enlargement. This can however not be realized without a drastic cut in volume. This will however favour a further regionalisation of pig meat production at European level. These family farm based pig meat production will likely be multifunctional farms, mobilising additional income sources through the provision of new rural services and the development of multifunctional rural enterprises. Obviously *De Hoeve* is to be understood as a kind of early, far from complete, version of this transition trajectory. A transition that eventually contributes substantially to sustainable rural development.

The other, agro-industrial perspective opts for a drastic scale enlargement, leaving the family farm concept, and a concentration of the pig sector in large multifunctional pig stores at agro-industrial sites. This should radically improve environmental performance (transportation miles, recycling of urban waste, animal warmth and manure, bio-energy production, etc.) and much attention is also paid to housing and animal welfare issues. In this transition trajectory pig meat production would remain internationally competitive. So no drastic reduction in volume is foreseen. This high-tech transition trajectory towards sustainable pig meat production entails a far reaching or full disconnection of the rural area in The Netherlands. Thus in this transition perspective pig farming will no longer contribute to sustainable rural development, aside from the fact that a number of serious environmental and spatial problems will be solved.

Conclusion 6:

The contribution of initiatives in making FSCs more sustainable cannot be assessed in terms of commercial performance or economic indicators alone. An assessment has to be based on a broader, more comprehensive definition and indicators of sustainable rural development. This should include building social capital and collective learning and innovation processes. An important contribution of these initiatives is that they show that it is possible to do things differently and in a promising way.

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Appendix 1: Environmental Certification System ('Milieukeur')

Foundation for Environmental Certification

In 1992 the Dutch government initiated the Foundation for Environmental Certification (*Stichting Milieukeur*) to enhance sustainable consumption and production. A supply chain certification system has been developed for a broad range of products. These were accordingly certified and labelled, by now more than 100 products food and non food (see www.milieukeur.nl). The independency of the Foundation for Environmental Certification and its certification system is guaranteed by the Dutch Counsel for Accreditation. The certification system focuses on developing environmental criteria and standards for sustainable production. In addition system develops criteria and standards for food safety and animal welfare. The certification system is dynamic. The criteria and norms are evaluated every year. If needed existing criteria and standards are adapted or new are added. The Foundation is mainly financed by the government, up to 84% of total costs are subsidised. The government, however, plans to decrease public contribution substantially in 2005.

Procedure for developing criteria and standards for a product

The procedure for developing criteria and standards for a product, starts with the application of a chain organisation for the *Environmental Certification Label* to the management board. This is the set off for a transparent, but extensive procedure. First, the Foundation has to be convinced that (environmental) sustainability performance can be improved substantially. Then a Commission of Advice, with representatives of societal organisations and chain members, is installed. They try to reach consensus about criteria and standards on the base of independent research. All organisations involved (producers, retail, societal organisations, etc) are then asked to comment on the proposed certification system in a public hearing. Also a Committee of experts is consulted. Finally the Executive board of the Foundation decides on the definite set of criteria and standards a product has to meet to become certified and use the *Environmental Certification Label*.

Extra demands and agreements for 'De Hoes' supply chain in relation to conventional pig meat (Milieukeur, 2004)

	Criteria	Standard (if applicable)
Feed	Good Manufacturing Practice system	
	Environmental friendly feed	April 2005
	No antibiotics in feed	
Basis	Meeting the Dutch regulation:(environmental licence, manure law, animal health, pigs decree of 1994 and 1998, decree PDV feed 1998, use of registered medication, light strength, lightning period, separation of aggressive and sick pigs, hygiene for visitors)	
	Meeting the Integral Chain Management demands	
	Pig farmers can only participating with the whole pig farm	
Manure and minerals	Registration of feed, fertiliser, demand and supply of pigs, energy use, medications	
	Maximum excretion of nitrogen and phosphate by piglets and meatpigs production from 0 kg	42.6 kg N en 17.6 kg P2O5/1000 kg growth
	Maximum excretion of nitrogen and phosphate meatpigs production from 25 kg	42.0 kg N en 16.0 kg P2O5/1000 kg growth
	Maximum ammonia emission production meatpigs from 0 kg	Formula
	Maximum ammoniak emission meatpigs from 25 kg	Formula
Animal welfare	Only castration of piglets if necessary then at the latest 7 days after birth	

animal health	Sober delivery of slaughtering pigs	12 hour before delivery no feed
	Separate sick bay available: space for minimal 1% of the total pig places with full litter	
	Drop out rate meat pigs	< 1,8%/year
	Drop out rate weaned piglets	< 2,1% year
	Leg, lung and other organ diseases	< 85% of the average slaughterhouse delivery
	Working plan with ear and tail necroses	
	Tail cutting, slipping of teeth, nose clip is forbidden	
	With the removing of pigs partitions have to be used The use of electronic pig drivers is forbidden.	
	Toys are available in the sty	
	Tie of sows is forbidden	
	Unlimited access to drinking water	
	Every 4 weeks visit by a veterinarian. Report of: diseases, leg problems , number of pigs apply where euthanasia is applied, affect and damaging because of sty inventory	
	Energy	Energy measuring rod Advantage by buying Green energy (use of conversion factor 3.6 in stead of 10) Advantage by using own sun or wind energy (reduction in accounted energy use of 1kwh = - 10 MJp)
Hygiene	Meeting the HACCP demands	
Packaging	The use of PVC, Cadmium of chlorated material in packaging is forbidden	
Policy	Environmental policy declaration available	
Canalisation	Environmental Certified meat products are separated in time and place from non certified products	
	Minimal 75% Environmental Certified meat into meat products	
Registration	Registration of the purchase and sales of Environmental Certified products	
Registration	Registration of the purchase and sales of Environmental Certified products	
Hygiene	Meeting the HACCP demands	

Canalisation	Greenlabel meat products are separated in time or place from non Green Label products	
	With selling points where fresh meat is sold without pre packaging 100% of the pigmeat supply have to be of Green Label origin. There is an exception for some products (spare ribs, organs, pork tenderloin, possible	

Appendix 2: Agro Chain Knowledge

Foundation for Agro Chain Knowledge (Stichting Agro Keten Kennis)

In 1994 the Government installed the Foundation Agro Chain Knowledge to enhance the improvement and innovation in products and processes in response to changing societal demands (www.akk.nl). In 1999 government initiated a support programme for improving value added in pig meat supply chains. Task of the Foundation is a.o. to facilitate chain members by writing project proposals and to have chain partners, societal organisations and researchers work together. To stimulate exchange between research and practice, the involvement of research institutes is obligatory in getting financial support.

Official project description De Hoeve

Some pig farmers want to co-operate with slaughterhouses, meat processors, wholesalers and butchers to be able to meet market demands towards environment, animal welfare and food safety. They intend to develop an economic feasible and sustainable market driven pig meat supply chain. The project has to develop a model in which attention is paid to supply chain strategy and the role and tasks of the chain organisation. The model has to structure the new supply chain. A condition for participation of pig farmers is that sustainability criteria and standards are developed and controlled by an independent certification system, in casu the *Environmental Certification system (Milieukeur)*. In addition the certification system has to deliver relevant management information for governing/controlling the chain against minimal costs (www.akk.nl).

Start of the project: 10/01/1999
Period: 46 months
Subsidy: 418.000€