Determining the opportunities for lowering the carbon footprint of the Dutch pork industry

Public version

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Student:	Loek Verwijst; 870912-886-090
Academic supervisors:	Dr. Vincent Blok; MST
	Dr. Jos Verstegen; LEI
Company supervisor:	Harold Theunissen; VION
Co-reader:	Paul Jansen; VION
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Preface

This report is the result of research conducted between January and August 2012 at VION Food Netherlands in Boxtel, supervised by the Management Studies Group of Wageningen UR. It is submitted in order to fulfil the Msc. programme Management, Innovation and Life Sciences.This document is a public summary of the original report, which only includes this preface, the abstract and a management summary, without the confidential elements.

Carrying out a Master thesis is an intensive process. I am very grateful for the support I received from many people. First I would like to thank my supervisors for their commitment in guiding me through the process of this research. I would like to thank Dr. Vincent Blok for his enthusiasm, his scientific guidance, and his honest and straightforward feedback during this project. Then I would like to thank Harold Theunissen, my company supervisor, for his practical insights on the perspective of the company, and the trust he gave me to speak with his business relations. Thirdly, I would like to thank Dr. Jos Verstegen, my second university supervisor, for his additional insights, feedback and recommendations during the project. Last but not least, I would like to thank Paul Jansen, director Public affairs and Sustainability, for giving me the opportunity to develop my Master thesis at VION. Altogether, my supervisors gave me the opportunity to write a scientific report applicable in the practical environment of the pork supply chain.

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Abstract

This thesis report is written to answer the research question *What changes should a multinational meat processing company apply to lower the carbon footprint of pork?*

Environmental sustainability is a growing topic for commercial food companies. On the one hand, this is a forced movement by society, but it also gives opportunities to improve efficiency and reduce costs. This research focuses on the improvement of the carbon footprint of Dutch pork. This subject is addressed by VIONFood Group, a 9 billion turnover meat processing company, mainly active in the Netherlands, Germany and Great Britain. VION wants to respond to these developments and stands for strategic choices with regard to different opportunities to lower the improvement of the carbon footprint of pork.

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Aspects important for partnership, are assessed in empirical research, and show the focus points for improvements. Next to that, barriers for organizational changes are assessed, and possible practical implications for lowering the carbon footprint are identified to give recommendations on this subject.

Keywords: carbon footprint, pork supply chain, multi-stakeholder alliance

Management Summary

This research has the aim to find opportunities to lower the carbon footprint of the pork supply chain, in order to give an advice to VION Food Netherlands on the implementation of their sustainability policy. This research is executed by a preliminary desk research to analyse (1) the operationalization of environmental sustainability in the food business, (2) existing literature on corporate- and sustainability strategies, (3) previous research on the setup of partnerships in a multi-stakeholder alliance, and (4) organizational change management theories for improving collaboration in the pork supply chain on sustainable development issues. These four subjects are assessed in an empirical analysis, executed on partners within and outside the supply chain of VION. The pork supply chain was divided in 5 chain parts: the feed producers, farmers, processors (VION), Industry (Unilever/Unox) and retail. Next to those partners within the pork supply chain, respondents from two NGOs (Dierenbescherming and Stichting Natuur en Milieu) were selected, as stakeholders on the subject from outside the supply chain. On top of that, three knowledge institutes (Blonk Milieu Advies, CLM, Wageningen University) were interviewed, to gain expert insights on the theoretical findings, and their applicability on sustainability issues in the pork supply chain. Finally, an overview is given on practical implementations available to lower the carbon footprint of the pork supply chain.

Environmental sustainability

Sustainability can be divided in people, planet and profit (3P's). Environmental sustainability contains all 'planet' aspects, and can be defined as *all aspects that have environmental impactduring the whole production process.* Within companies, sustainability concerns are mostly addressed in a corporate social responsibility (CSR) policy. CSR policies are adopted in all kinds of companies, but the application and translation to specific tasks is different for each type of business. Firms can have different motives to implement CSR, which can be public-serving or firm serving. Next to that, they can apply it proactively or reactively towards their environment, of which a proactive attitude has a positive effect on the firm's reputation. Enhancing long term competitive advantage can be a motive to improve the environmental sustainability. In order to succeed in this process, a long term view on profitability is needed. Looking more specifically to meat supply chains, concerns around sustainable development are addressed by the Dutch committee *Het Verbond van Den Bosch,* who set the ambition to develop sustainability in the meat supply chain, towards sustainable meat in 2020.

Companies address sustainable development in their CSR policies. CSR is a suitable approach to apply environmental sustainability in the food business, although it is hard to link environmental improvements directly to a managerial CSR policy. That makes it difficult to operationalize environmental sustainability in the food business. Therefore, this is mainly done by measuring sustainable development within a production chain (which means one should measure improvements during time). When focussing on environmental sustainability, one can look to the carbon footprint, energy use, waste and land use

needed to produce a product. This research focussed on the carbon footprint of the end product, expressed in CO_2 equivalents. After measuring this (and consensus on the method to do so is found), targets can be set to decrease the amount of CO_2 equivalents. Previous footprint measurements found that the build-up of the footprint of the pork supply chain is mainly caused by feed production and manure storage on farms. Nevertheless, footprint reduction measurements cannot be considered as a responsibility of these actors alone. This means the whole supply chain of the product should be involved in this process.

Fit to corporate- and sustainability strategies

The next step taken in this research was an analysis of the fit between the corporate value strategies of Treacy and Wiersema the sustainability strategies of Baumgartner of the Dutch supply chain partners of VION. The result of this comparison can be found in Table1.

Table1: Combination of Value- and Sustainability strategies

Value strategies Treacy and Wiersema	Sustainability strategies Baumgartner			
	Introverted	Extroverted	Conservative	Visionary
Operational excellence	++	0	+++	0
Product leadership	+	++	0	+++
Customer intimacy	0	+++	0	++

0 = no correlation; + = little correlation; ++ = medium correlation; +++ = high correlation

This clearly shows that product leadership and customer intimacy can be linked to the same sustainability strategies -the extroverted and visionary strategy- whereas operational excellence has correlation with the conservative and introverted sustainability strategies. After these theoretical findings, the value and sustainability strategy of VION is analysed.

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After the analysis of value and sustainability strategy of VION, an assessment is made on the fit between the corporate- and sustainability strategies of each part of the supply chain, which is summarized in table 2.

Table 2: Schematic overview alignment of value- and sustainability strategies

Chain part	Value strategy	Sustainability strategy	Alignment[1]
Feed producers			
Farmers			
VION			
FrieslandCampina			
Industry (Unilever/Unox)			
Retail			

[1]: 0 = no alignment; + = small alignment; ++ = medium alignment; +++ = large alignment

Table 2 shows that the alignment of value- and sustainability strategy of each company in the pork supply chain is generally large to medium. Unilever and FrieslandCampina both have a medium score, because the conservative strategy has no specific match with their value strategy

(…)

When looking to vertical alignment throughout the chain, it becomes clear that the value strategies merge during the chain from operational excellence to customer intimacy, with elements of product leadership. In the sustainability strategy analysis, a similar pattern is visible from a combination of introvert and conservative, to a more extrovert and visionary strategy. The position of VION is at the 'turning point' between operational excellence upstream in the chain, and customer intimacy downstream in the chain. Therefore, it makes sense that VION aims to combine both strategies, but it also shows they have a complicated position in the supply chain.

Previous research (of Baumgartner) mainly focussed on the fit between value- and sustainability strategies at firm level. The way table 2 gives an overview on horizontal and vertical alignment of strategies can also help other companies active in a (food) supply chain to understand each other's view and motivation to sustainability (as a way to reduce costs, or to create competitive advantage). This clearly shows that one should look at these theories from a supply chain perspective, which should be an incentive to increase collaboration within the supply chain.

Increasing collaboration by a Multi-Stakeholder Alliance (MSA)

In order to implement measures needed to lower the carbon footprint of the pork supply chain, it was expected that more collaboration of partners within and outside the supply chain is needed. Therefore, the next step of this research was to identify whether the set-up of a multi-stakeholder alliance would be a suitable way to implement sustainability measures in the Dutch pork supply chain. Based on theoretical findings, it was concluded that a multi-stakeholder alliance can be a suitable structure, if firms from all supply chain parts show willingness and ability to increase collaboration in order to lower the carbon footprint of the Dutch pork supply chain. (…) Next to that it was indicated that collaboration in a supply chain can only occur when taking market competition into account. This shows that current market mechanisms and competition within each supply chain part play a role in the fact that long term

partnerships through the supply chain are difficult to realize. Next to that, the general preference to focus on direct suppliers and customers should be extended with a whole supply chain approach. The fact that the need for integrated supply chain collaboration is relatively low by companies at the end of the chain is an indication of a short term view on the usefulness of partnerships. Next to that, it shows that partners in the end of the chain are more powerful and therefore do not need more interaction with other supply chain partners. In addition, one has to consider the complexity of a meat supply chain. In this research, the supply chain was divided in five chain parts (feed producers, farmers, processors, brands, retailers). Even in this simplified version of a meat supply chain, collaboration would already be a challenge. In practice a lot of smaller companies interfere, operating in between supply chain parts, or overlap with activities of others.

(…) It might be clear that the set-up of a multi stakeholder alliance can only be suitable if all partners within the chain are convinced of its usefulness, and if power among partners is as equally shared as possible. Combining that with the additional findings on supply chain complexity, we conclude that the pork supply chain is currently not (yet) ready for the set-up of a multi-stakeholder alliance.

Organizational changes to increase collaboration on sustainable development

When striving for a multi-stakeholder alliance in the future, one has to find out what organizational changes are needed to increase collaboration. Therefore, relevant theories on organizational change management were analysed. After that, an assessment is made on the ability of firms in the pork supply chain to implement the organizational changes. This is based on the six steps model of Rondinelli and London (2003). Below, the six steps needed in partnerships are given:

a) Ground of collaboration
b) Partner selection
c) Type of agreements
d) Clarity of goal setting
e) Clarity of task division
f) Amount of trust and confidentiality

For each citation related to partnerships, the link to one of the steps is indicated with one of the letters a until f, which shows the company has the ability to actively determine choices in collaboration concerning the specific step.

Table 3: Schematic overview on the ability to implement collaboration steps

Chain part	a	b	c	d	e	f
Feed producers						
Farmers						
VION						
FrieslandCampina						
Industry						
Retail						

The square roots presented in Table 3, indicates that evidence is found the company is able to meet with the corresponding step (a until f). It is striking that in this analysis, VION and FrieslandCampina have the same score, although it became clear that FrieslandCampina has a better alignment between their value and sustainability strategy.

It becomes clear that no examples on ways to divide tasks or create trust are given (e and f). This proves the feeling of companies at the beginning of the supply chain that they just have to meet with the goals of their customers. In the contrary, every part of the chain indicates the use of one or more of the partner selection criteria. It is clear that this point is seen as important, in the execution of supply chain collaboration, and partnerships with NGOs. The further downstream the supply chain, examples of clear goal setting (d) are given, which indicates goal setting takes place at those parts of the supply chain. Examples on clear procedures are given in the three middle parts of the chain, which show those organizations are most concerned about this step in supply chain collaboration.

Looking more specifically to NGOs, it appeared that the strategy of NGOs made a shift in the past decade, which resulted in increased and more constructive interaction with the pork supply chain.Nevertheless, they clearly address the responsibility of the pork supply chain to overcome constraints in complexity. Currently they tend to interact most with the most powerful actors in the chain, but similarly they try to take in to account the situation of farmers, and their ability to meet with (upcoming) standards. They are aware that their reputation towards society is useful for the pork supply chain, and are willing to label animal products, as long as they are sure it does not harm their integrity. Several partners within the supply chain explain the involvement of NGOs result in less independence with regard to their business operation, which can result in distrust in future demands of NGOs.

When looking to the role of the farmer, it becomes clear that other stakeholders address the fact that they are pushed in the operational excellence strategy in the past, and that a transition to more sustainable production systems is not always affordable. In the same time, stakeholders expect that farmers are entrepreneurs who keep up with market developments, which means they should not invest in housing systems of which is clear they will not be suitable in the near future.

Below, the most constraining barriers to increase collaboration of partners within and outside the supply chain are summarized:

- Competition within the supply chain, which decreases the ability of trusting each other;
- (…)
- Goals are set by partners at the end of the chain, but they leave the execution of those goals to their suppliers;
- The interference of NGOs has a positive influence on consumer trust related to sustainable development of the pork supply chain, but supply chain partners feel they have not enough influence on upcoming regulations.

Practical implications to lower the carbon footprint

In the last step of this research, an overview was given on the most effective implications, useful to lower the carbon footprint of the pork supply chain. (…) One should consider that implementation of the above sustainability measures is only possible when no additional costs occur, since it will be difficult to calculate this through the chain. Therefore, one has to realize implementation can only be done when taking individual circumstances into account (think of stage in the farmer's investment plan, roof positioning to the sun, and amount of pig farms in his neighbourhood to share investments).

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