Demand of the meat industry for management support in R&D cooperation projects

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Abstract

The present paper specifies and explains the demand for comprehensive management support in research and development (R&D) cooperations for industrial actors within the European meat industry. In an empirical study, 67 meat industry companies have been questioned regarding their requirements. As a result, 17 management support service elements could be identified which are associated with different innovation phases. Further analysis of the data reveal different demand profiles. For example, the need to differentiate companies regarding their R&D cooperation experiences is obvious. The effort required for coordination tasks in R&D cooperation projects is underestimated by participating companies without previous R&D cooperation experience. The overall conclusion is that an innovation broker approach for complex R&D cooperation projects in the meat industry is needed. Following this approach, support services should take into account a combination of differing company characteristics.

Keywords: R&D cooperation; Management support services; Innovation broker; Public-private partnerships; Open innovation; Meat industry

1 Introduction

It is a challenge for politics, economy and science to strengthen innovation within and between companies with the aim of improving performance in the globally competitive environment. This process focussing on two approaches: First, incentive systems for R&D cooperation between companies (business to business). And second, incentive systems for R&D cooperation between business and science. Both approaches provide the foundation for a range of national and international research framework programmes and cluster initiatives (Sölvell et al. 2003). Paralled to this, political leaders of the European Union have formulated an EU strategy that aims achieve “the most dynamic and competitive knowledge-based economy in the world” (European Commission, 2005). Due to that, companies should benefit more from the research activities within universities and research institutions.

In recent years, R&D cooperation in the meat industry has been characterised by becoming apparent that cooperation along complete value chains is necessary (Lambert et al., 2000). This is especially important for quality management processes. For example, different companies at the level of primary production, processing and trading take responsibility regarding their own areas of accountability so as to produce high quality meat products. The majority of producing companies in the meat value chain have adopted their internal control

systems according to legislation (EU General Food Law) in recent years. One can say that the meat industry has already made significant progress in the last decade. The current challenge is to interlink internal systems on an interorganisational level in order to create efficient quality management systems for complete value chains (Robinson et al., 2005). To improve such systems it is of high importance to implement interoperational inspection and communication systems rather than to rely on single components and isolated applications (Trienekens et al., 2009; Schulze Althoff et al., 2005).

As a sequel to the examples described above, one might assume that R&D cooperation between value chain actors in the frame of a concerted innovation process is needed to develop interorganisational quality management systems. The various stages within the value chain – including agricultural production as well as slaughter companies, processing plants and retailers – have to communicate and cooperate with each other and as well as with suppliers of technologies and services on the one hand and with scientists on the other hand. The challenge is to combine all these actors into functioning R&D consortia. This implies that synergies will be created in the cooperation. And furthermore that single actors as well as complete value chains have more advantages than disadvantages as is expected to be shown by the joint generation of new knowledge and by finding collaborative solutions to accomplish present and future demands of the market (with respect to food safety, food quality, traceability etc.).

However, participating in complex, system oriented and interorganisational R&D cooperations is difficult for a large number of producing companies within meat value chains. In particular, companies involved in primary production and at the meat processing level are overwhelmingly small and medium sized enterprises (SMEs). These producing plants lack resources for R&D activities. Compared to bigger production plants (e.g. at the slaughter level, bigger processing plants and retailers) or the majority of suppliers of technologies and services. It is assumed that these companies are more highly equipped with resources and/or experience to fulfil R&D cooperation requirements adequately. With regard to the globally competitive market – (and the requirement from the political sector that companies should benefit more from the research activities at universities and research institutions) it is of enormous importance to facilitate R&D cooperation between all described actors within the meat industry.

With this background, the study presented in this paper focuses especially on industrial actors in R&D cooperations within the meat industry by raising the research question:

- *What is the demand within the meat industry for management support in R&D cooperation projects?*

The following sub questions were formulated to extend the scope of the question as well as taking into account the structure of the meat industry and specific challenges expected to be encountered in complex R&D cooperation:

- *In which phase of the innovation process do companies require specific management support service elements?*
- *Is there a relation between the scope of management support service elements and the company size?*
- *Is there a relation between the scope of management support service elements and cooperation experiences?*

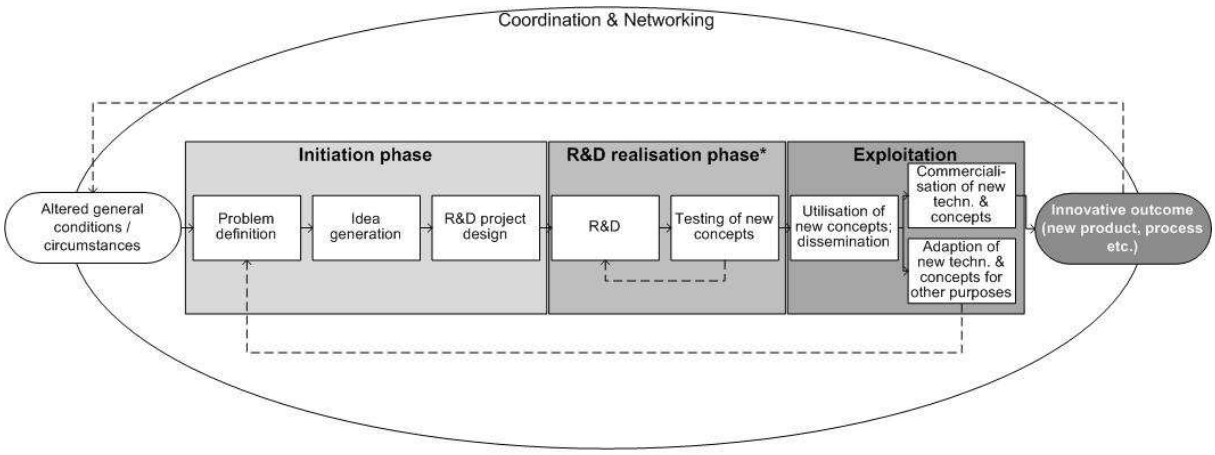
It can be assumed that particular company features require a targeted support to enable companies to participate or even to initiate R&D cooperation projects. Therefore, these

questions are important for institutions that already offer management support services for actors intending to take part in R&D cooperation consortia.

2 Theoretical background

This paper focuses on R&D cooperation. R&D is one part of the innovation process. It "comprise creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this stock of knowledge to devise new applications" (OECD, 2002). R&D can be distinguished between intramural and extramural. Extramural R&D (also called R&D cooperation) can be understood as an element within the open innovation concept. The term 'open innovation' describes the approach of companies that open up their R&D activities for other actors to generate new ideas and new knowledge with the aim of stimulating innovation instead of solely internally generating new knowledge. To increase innovation, companies use external resources for their internal sustainable development (Chesbrough, 2003). Open innovation and innovation, as such, secure the profitability of a company and of entire value chains and sectors (Menrad, 2004). Although it should be borne in mind that R&D is simply one part of the whole innovation process. The result of successful R&D – the generation of new knowledge, an invention, an innovative idea or an innovative concept is no innovation as long as the idea (etc.) has been productively incorporated into the enterprise's activities. Subsequently, it has to be introduced to the market (Rogers, 1998; Henry et al., 1991; European Commission, 2004). That means that specific organisational, financial and commercial steps (which are intended to lead to the implementation of innovations) are as crucial for the innovation process as is the result of successful R&D.

An innovation process is caused by altered conditions and circumstances. It can be divided roughly into three core phases: Initiation, R&D realisation and exploitation (see figure 1). Each phase comprises various different activities. For example, the realisation phase comprises activities like the acquisition of external knowledge; intramural R&D (in-house); extramural R&D (open innovation / cooperation); acquisition of machinery, equipment and software etc. (OECD, 2002). Since this paper exclusively focuses on R&D cooperation the R&D realisation phase is equivalent to 'extramural R&D'.



*Since the research focus is on R&D cooperation the R&D realisation phase is equivalent to 'extramural R&D'. Beside extramural R&D the R&D realisation phase might comprises, in another context, activities like intramural R&D (in-house); acquisition of machinery, equipment and software etc. (OECD, 2002).

Source: Figure based on Bruns et al., 2008; Menrad, 2004; Rosenfeld et al., 1991; Rothwell, 1994; Schlicksupp, 1992; Schroeder et al., 1986; Trommsdorff, 1990

Figure 1 Phases of the innovation process

The phases accomplished serially. Since R&D activities are "high risk", it is common to repeat process stages by undertaking corrections or even trying alternative approaches as a solution to a problem. Hence the innovation process can be described as an iterative process or as a learning loop. The core phases are accompanied by overlapping activities like networking and coordination, which take place during the whole innovation process.

It can be assumed that in complex R&D cooperation constellations involving scientific and industrial actors aiming at a joint generation of new knowledge, special problems regarding planning (e.g. searching for appropriate partners) and management (e.g. like coordination of consortium) are likely to occur. Reasons for this hurdles might be different backgrounds of various partners regarding organisational culture and more specifically research approaches, the availability and deployment of missing resources, and, not the least, the huge administrative effort required in the management of complex R&D cooperation projects. Potential barriers related to the formation and establishment of R&D cooperation consortia and as well the realisation of R&D cooperation projects are listed in the following table (based on Aslesen et al., 1999; De Jong et al., 2007; Klerkx, 2008; Lienemann, 2005; SMEs-Net, 2006; Rammer et al., 2006; Rammer et al., 2008; Fortuin et al. 2007; European Commission, 2004; Trienekens et al., 2008). These barriers are assigned to different stages of the innovation process (illustrated in figure 1).

Table 1 Barriers related to R&D cooperation projects assigned to stages of the innovation process

Innovation process phase		*Barriers*
Core phases	***Initiation***	• Lack of expertise regarding identification of innovation demand (micro-perspective and / or macro-perspective) • Lack of expertise regarding structured idea management • Thematical focus of R&D joint project does not fit to the innovation strategy of the single company • Lack of expertise regarding searching of potential cooperation partners • Lack of SMART project planning (**s**pecific, **m**easurable, **a**chievable, **r**ealistic, **t**ime-bound) • Lack of financing & lack of expertise to apply for public funds (incl. experiences regarding extensive application procedure)
	R&D realisation	Management barriers in the R&D realisation phase are overarching barriers that are not limited to the R&D realisation phase (these barriers are listed under "Coordination").
	Exploitation	• Risk of spill over of knowledge • Unsatisfactory agreements regarding common intellectual property
Overlapping phases	***Networking***	• Different culture of cooperation partners • Different levels of language skills
	Coordination	• Extensive administrative procedure • Lack of time and specific project management exptertise • Lack of information flow and communication

Barriers related to the formation and establishment of R&D cooperation consortia and as well the realisation of R&D cooperation projects can be associated with transaction and coordination failures. The service of a third party (beside science and business actors) might minimise these failures for consortium partners while transaction and coordination tasks are taken over by this third party. Potential transaction and coordination tasks especially for R&D cooperation projects are worked out in this paper based on the transaction cost theory. The transaction cost theory is classified within the field of new institutional economics (Erlei, 2007). New institutional economics consider additional arising costs which occur in connection to transactionssuch as coordination costs. Compared to that, neoclassical theories assume complete market transparency. In order that goods and services are interchanged without recognition of additional costs which occur on top of the expected price.

Coase (1999), who introduces transactions costs into the economic theory, causes the existence of firms by the costs of market utilisation. Firms do exist since market utilisation costs are higher than firm internal hierarchical utilisation costs (Voigt, 2002). In the case of R&D cooperation projects it is a question of company internal available resources for R&D activities. If resources for R&D are internally not available the company need to make a

decision: Is it more cost-efficient to build up R&D competences internally (e.g. by hiring scientific and competent personal and by building up research facilities) or is it more cost-efficient to find R&D resources on the market. The transaction cost theory gives an explanational approach for decisions to carry out transactions at the market, corporation internal or to prefer a hybrid organisation mode (Erlei, 2007). In this regard three kinds of transaction cost categories need to be considered: *Searching- and information costs* (eligible transaction partners have to be found; therefore, prices and quality of potential transaction partners have to be compared), *bargaining- and decision costs* (expenditure for the exchange of rights of disposal, like drawing up agreements, agreement negotiations, legal advices, preparation of information), *policing- and enforcement costs* (the observance of agreements has to be controlled (Richter et al., 2003).

By integrating a third party in R&D cooperation projects (beside the consortium partners science and business) this party could focus on the minimisation of transaction and coordination barriers. “Such intermediary activities include: helping to provide information about potential collaborators; brokering a transaction between two or more parties; acting as a mediator, or go-between, bodies or organizations that are already collaborating; and helping find advice, funding and support for the innovation outcomes of such collaborations” (Howells, 2006). According to Howells (2006) this third party might be “an organization or body that acts [as] an agent or broker in any aspect of the innovation process between two or more”. Beside that definition the literature present most diverse terminologies regarding third parties with different functions. Most of them act as a broker or intermediary in an innovation network. One could work out mainly two different kinds of third parties. Some concentrate solely on the intermediation between actors. They work as a supporter in innovation systems aiming to facilitate collaborative innovation processes and innovation activities. Others additionally provide content and knowledge. They function as well as an innovation source (Chesbrough, 2006; Den Hertog, 2000; Hargadon et al., 1997; Howells, 2006; Klerkx, 2008; Klerkx et al. 2009; Winch et al., 2007). The terminology is most diverse. While Hargadon and Sutton (1997) for example defined the term “knowledge or technology broker”, this paper follows rather the definition of Winch and Courtney (2007): “An innovation broker is an organization acting as a member of a network of actors in an industrial sector that is focused neither on the generation nor the implementation of innovations, but on enabling other organizations to innovate.” According to this definition the third party does not participate directly in the generation of new knowledge during the R&D realisation phase (see figure 1).

Based on a combination of transaction cost theory and the third party approach a catalogue of management support service elements has been developed to overcome transaction and coordination barriers (table 2). Assuming by the integration of a third party, supporting other organisation to innovate, R&D cooperation consortia would be more efficiently since the scientific and industrial actors within the consortium are able to concentrate on the content of an innovation process – the generation and adaption of new knowledge.

3 Data and methods

Management support service elements are identified aiming to enable actors to innovate in R&D cooperation projects (see table 2 in chapter 4). They lay the groundwork for the development of the inquiry instrument. The core part of the inquiry instrument approaches the research question: *What is the demand within the meat industry for management support in R&D cooperation projects?* To integrate these results in a broader sense, one part of the questionnaire refers to the relevance of innovation and R&D cooperation in enterprises. Likert-scales have mainly been used to measure the level of agreement to a statement. In

addition, enterprise data have been compiled for statistical analysis to be able to examine differences between SMEs and bigger companies as well as between companies with and without R&D cooperation experience.

The inquiry instrument used was in the form of a questionnaire, which was sent out to approximately 700 companies at the beginning of 2009. To address companies with R&D cooperation experience industrial partners involved in the Integrated Project 'Q-PorkChains' (funded by the EU 6th framework programme) were selected for the inquiry. The aim of the project is to improve the quality of pork and pork products for the consumer and to develop innovative, integrated and sustainable food production chains with low environmental impact. The consortium consists of 62 partners from 20 different countries including 33 research institutions, 29 business partners and industry associations. Furthermore the questionnaire has been sent to members of the European R&D network GIQS (Trans Border Integrated Quality Assurance). The network management has the objective of supporting actors in value chains and networks within the agrifood business regarding the design, preparation and realisation of R&D cooperation projects. Furthermore, the targeted transfer of knowledge is a particular focus. The cooperation between business, science and public bodies is based on the public-private partnership approach.

To address companies without R&D cooperation experiences as well, support has been given by a pig producer association and also by a consultancy in the agrifood business. These institutions also sent questionnaires to their network members.

With a response rate of approximately 10 %, 67 companies took part in the inquiry. The majority of these companies are in the following subsectors of the meat industry: pork (59 companies), beef (42 companies), poultry (31 companies) and lamb (19 companies). Several production stages within the value chain are represented in the sample. All in all, 13 companies from primary production, 18 companies from slaughtering and deboning, 22 companies from the processing level, 13 companies as suppliers of goods and 27 service companies have been analysed. The companies do not add to 100% since the single characteristics are not exclusion criteria. For example, actors producing beef can as well produce pork. The same with actors located in the value chain. Slaughter companies can equally be active at the processing stage.

Three analysis steps have been conducted in order to find an answer to the research question and sub-questions:

1. Analysis regarding the demand frequency of management support service elements by industrial actors of the meat industry in R&D cooperation projects
2. Comparison of demand profiles between SMEs and bigger companies
3. Comparison of demand profiles between companies with and without R&D cooperation experiences

By dividing the companies into two groups, SMEs and bigger companies, the total amount of companies decreased due to the fact that not all companies gave sufficient information regarding their company size for classification into one group. 28 SMEs and 21 bigger companies were compared[1]. The second comparison, based on R&D cooperation experience, has been conducted with a group of 46 companies with R&D cooperation experience and a group of 20 companies without R&D cooperation experience.

For analysing differences between these groups, the independent-samples t-test is normally been used. However, the t-test is invalid when certain critical assumptions are not met. The t-

test assumes that the sample mean is a valid measure of centre (distance between all scale values is equal). In case of an ordinal test variable (distances between the values are arbitrary) a t-test is invalid. Since the assumptions of a t-test are not met (like normal distribution) the nonparametric Mann-Whitney-Wilcoxon test for two independent samples has been chosen to determine the significance of demand profiles of company groups (by size and by R&D cooperation experience). The Mann-Whitney-Wilcoxon test can be used regardless of the sample characteristics (Pappas et al., 2004; UCLA, 2010).

4 Results

The catalogue of management support services which is incorporated in the design of the empirical study lists support services in R&D cooperation projects aimed at enabling other organisations to innovate (see table 2). The catalogue of management support service elements is based on a combination of transaction cost theory and the third party approach (see chapter 2).

Table 2 Catalogue of management support service elements in R&D cooperation projects

Innovation process phase		***Management support service elements***
Core phases	***Initiation***	• Support regarding the identification of innovation demand of the value chain. • Initiation of R&D cooperation. • Looking for subsidies and applying for subsidies. • Development of a consistent project plan. • Setting up and tuning the consortium agreement.
	R&D realisation	According to the definition of Winch and Courtney (2007), a third party combines transaction and coordination tasks in R&D cooperation projects with the aim of enabling other actors to concentrate on the content of the innovation process. This actor does not directly participate in the generation of new knowledge. The transaction and coordination tasks undertaken according to this phase are overarching tasks that are not limited to the R&D realisation phase (see "Coordination").
	Exploitation	• Management support regarding the implementation of new technologies, new concepts. • Dissemination of results (publications, trainings, workshops). • Support during the protection of results / know-how (e.g. patent advice). • Support during the implementation of successfully tested concepts / techniques into the daily business or during the commercialisation of successfully developed products.
Overlapping phases	***Networking***	• Organisation of direct contact possibilities between business persons, research and representatives from the political level. • Bringing project partners together. • Guaranteeing the communication between partners. • Matchmaking between unknown partners. • Mediation if conflicts and disagreements between partners appear.
	Coordination	• Taking over project specific management and administration tasks for the whole consortium (project controlling regarding costs, time and tasks compliance; project documentation). • Charing of team meetings. • Translation of financier's requirements into specific project guide lines.

By analysing the frequency of desired management support service elements in R&D cooperation projects (see figure 2), it can be stated that out of the whole portfolio of prompted management support service elements certain service elements connected to financial issues 'Applying for subsidies' and 'Translation of financiers' requirements in project guidelines' are required with a high frequency. Besides financial and administrative support issues, networking activities are in the focus of the services demanded by the meat industry. These service elements are most frequently desired by all company groups, by SMEs as well as bigger companies, and by companies with and without R&D cooperation experience. A ranking of management support service elements is given in the following figure.

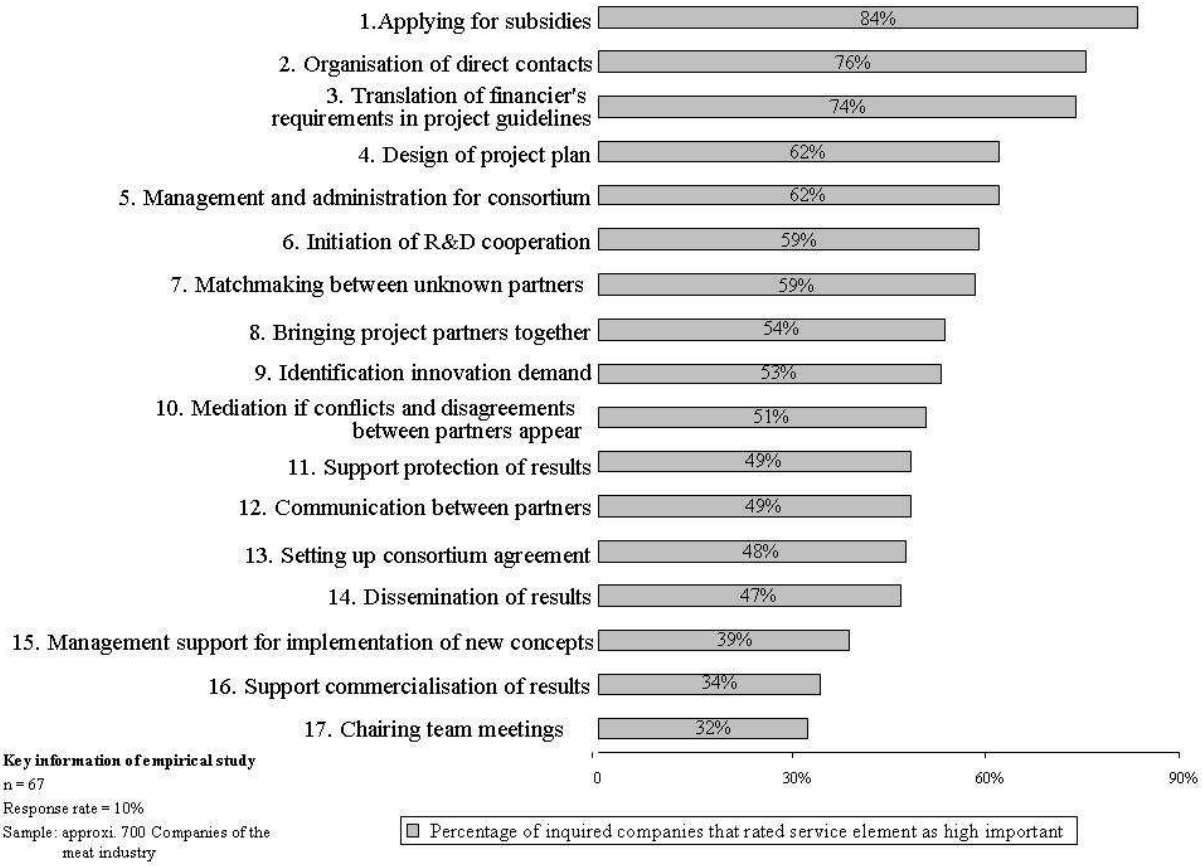


Figure 2 Industry demand for management support service elements.

Demand profiles of SMEs and bigger companies

Beside the three service elements mentioned above, which are desired by all companies in a similar frequency, differences can be observed by comparing the demand profiles of SMEs and bigger companies. The most identifiable differences can be recognised regarding service elements which are valued with a higher importance by SMEs (figure 3). The comparison indicates only one significant difference regarding the service element 'Support for the commercialisation of results', which is desired more by SMEs compared to bigger companies (.013 Mann-Whitney-Wilcoxon Test, 2-tailed).

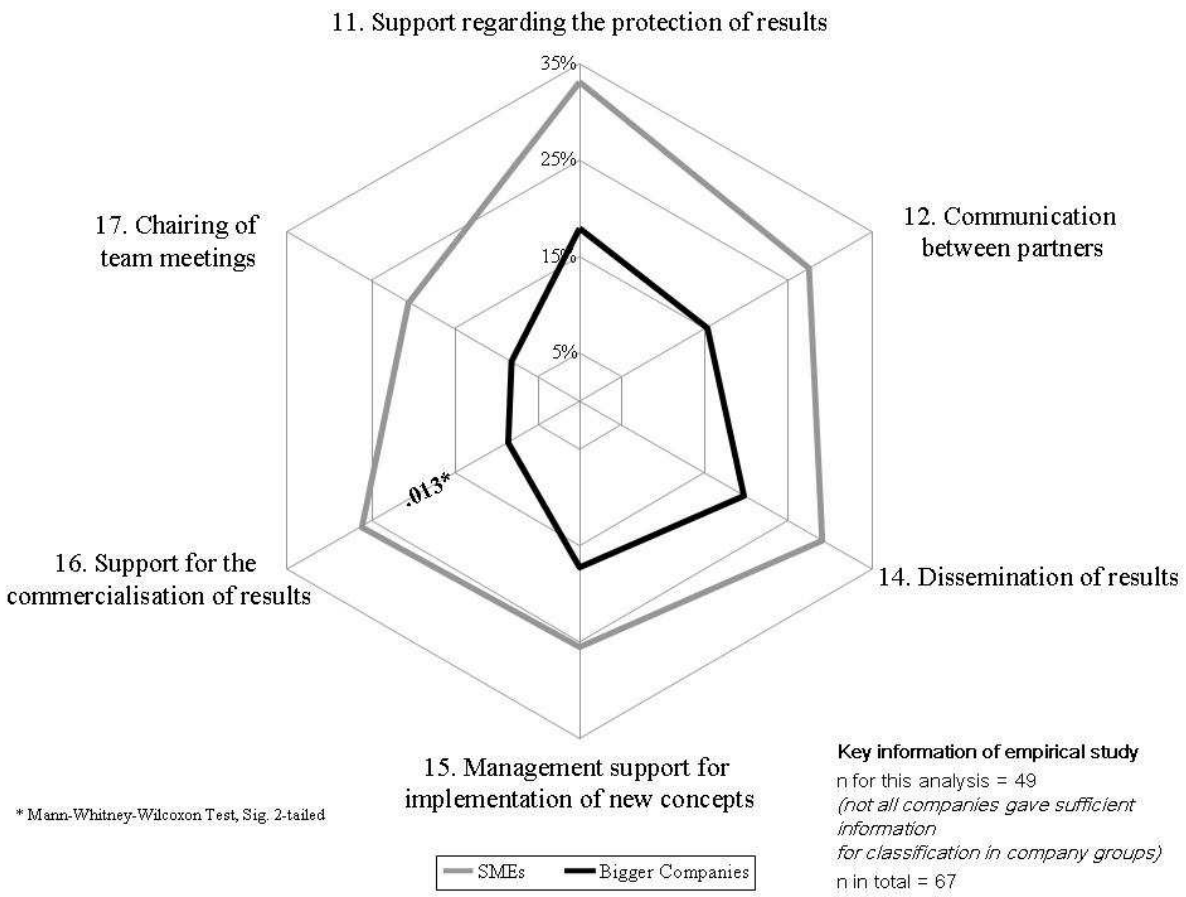


Figure 3 Comparison of demand profiles of SMEs and bigger companies.

Demand profiles of companies with and without R&D cooperation experiences

The analysis of demand profiles of companies with and without R&D cooperation experience (see figure 4) reveals significant differences regarding the demanded service elements 'Initiation of R&D cooperation' (.008 Mann-Whitney-Wilcoxon Test, 2-tailed), 'Management support for implementation of new concepts' (.019 Mann-Whitney-Wilcoxon Test, 2-tailed), and 'Setting up consortium agreement' (.046 Mann-Whitney-Wilcoxon Test, 2-tailed). Regarding the service elements 'Initiation of R&D cooperation' and 'Setting up consortium agreement' companies with R&D cooperation experience need more support than companies without R&D cooperation experience. In contrast to that, it is more important for companies without R&D cooperation experience to receive support in the field of 'Management support for the implementation of new concepts'.

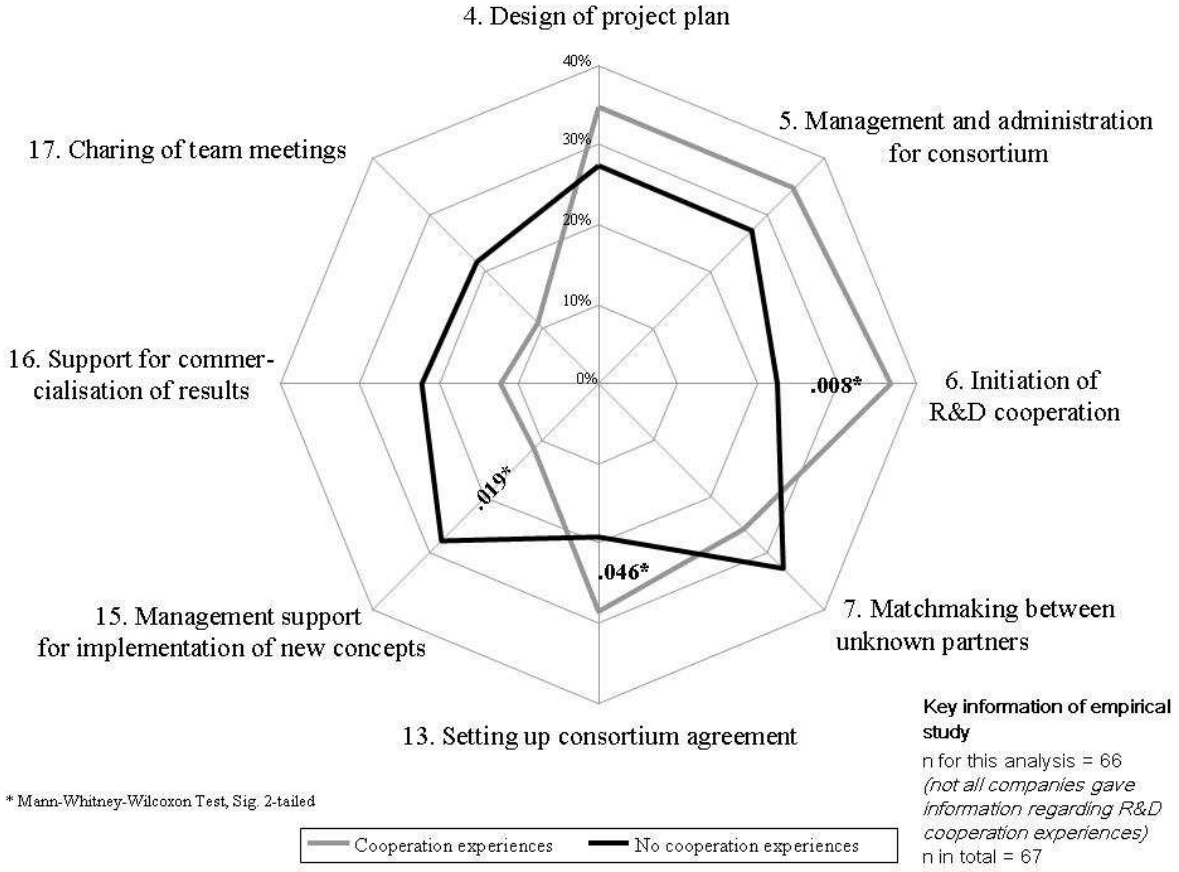


Figure 4 Comparison of demand profiles of companies with and without R&D cooperation experiences.

5 Discussion and conclusion

Regarding the research question: *What is the demand within the meat industry for management support in R&D cooperation projects?* it can be concluded that the present study delivers a number of significant results. All 17 identified service elements are more or less relevant. The results vary between 84% and 32% of questioned companies that rated single service elements as highly important. Especially the service elements connected to financial issues are demanded most frequently. Referring to the annual expenses for innovation activities it is not surprising that co-financing is an important issue (see as well Batterink et al., 2006). Companies try to increase their innovation budget. The inquiry illustrates that the annual expenses for innovation as a share of total turnover of participating companies are between 1% and 7%, varying amongst the different production stages of the chain. The questionnaire results were a surprise concerning the primary production level. The percentage of innovation expenses as a share of total turnover is relatively high (7%) at this level. An explanation might be that individual farmers themselves have not been investigated. At the farm level, mainly farm cooperatives have been researched. One task of these cooperatives is to support farmers to improve their production. Therefore it can be assumed that these are innovatively thinking actors supporting farmers in implementing changes, which have been developed (often in collaboration with universities) by these cooperatives. However, companies at the slaughter, processing and retailer level spent approximately 1% of their annual turnover for innovation.

Comparing the figures on innovation expenses of participating companies with figures produced in the frame of the fourth community innovation survey (CIS4) the innovation expenditures of surveyed slaughter and processing companies are lower. The average innovation expenditures as a share of total turnover at European companies in the manufacture of food products and beverages are 2.75% (Eurostat, 2006). However, the CIS does not include the primary production level of the food chain. The CIS figures on high tech sectors, 11% of their annual turnover are used for innovation activities (Eurostat, 2006), are in line with compiled data regarding food chain suppliers of services and goods in the empirical study presented in this paper. Participating suppliers in the food chain invest approximately 11% (as a share of total turnover) innovation expenditures. In this regard, it can be assumed that to a large degree, innovations are incorporated into the food production chain by suppliers delivering among others machinery, technologies, information and communication systems and services.

Beside the intense requirement regarding support in financial and administrative issues by the majority of respondents, the analysis focused on different demand profiles. Further more demand profiles based on the company features "company size" and "R&D cooperation experiences" has been analysed.

The results answer the first sub-question: *In which phase of the innovation process do companies require specific management support service elements?* 17 management support service elements are identified and associated with the different innovation phases. The majority of companies require support especially in one of the three core phases, the initiation phase. Furthermore, support in both overlapping phases, networking and coordination, is needed. The answers by participating companies are balanced regarding these three phases. Only management support in the exploitation phase seems to be less important for the majority. Regarding management support in the R&D realisation phase it needs to be mentioned that service elements are associated with the overlapping coordination phase (see table 2). This is based on the definition of an innovation broker by Winch and Courtney (2007). A third party does not participate itself in the generation of new knowledge, in the R&D realisation phase. This actor rather supports others by providing a coordination function during the R&D realisation phase.

The comparison of demand profiles between SMEs and bigger companies is targeting on answering the second sub-question: *Is there a relation between the scope of management support service elements and the company size?* Regarding the first eleven ranked service elements it can be concluded that no precise distinction between SMEs and bigger companies can be made. This is in contrast to the less demanded service elements on ranks 11, 12, 14-17 (see figure 3). In this case, differences can be recognised between SMEs and bigger companies. It has been proved that only one significant difference between SMEs and bigger companies has been found regarding support desired in terms of commercialisation of innovations like the market launch of new products or implementation of new knowledge to optimise processes etc.

Concerning the third sub-question: *Is there a relation between the scope of management support service elements and cooperation experiences?* The analysis indicated that a distinction between companies with and without R&D cooperation experiences can be made. Significant differences are visible regarding the service elements '6. Initiation of R&D cooperation', '13. Setting up consortium agreement' and '15. Management support for implementation of new concepts' (see figure 4).

In terms of companies with and without R&D cooperation experience, the data indicate that companies without R&D cooperation experience do not expect obstacles during the

organisational initiation and administrative handling of R&D cooperation projects. Whereas the response of companies with R&D cooperation experience implies that barriers need to be overcome. Due to their experiences, this group of companies explicitly desires support in the initiation phase of R&D cooperation projects also regarding administration aspects during all phases. Therefore, it can be deduced that the effort required for coordination tasks in R&D cooperation projects is underestimated by companies without R&D cooperation experience (participated in the survey). It is evident that especially if more cooperation partners from science and business are involved the necessity arises to satisfy all requirements during the design of a project – on the part of business partners (competitor- and supplier relationships), of science partners, of financiers and as well of a specific thematic focus in the case of public funding programmes. Especially in these complex R&D cooperation projects transaction and coordination tasks arise which cannot be undertaken by cooperation partners individually. In these cases a third party, not directly participating in the generation of new knowledge, but rather enabling other actors to concentrate on the generation of new knowledge, is needed to coordinate actions.

At first glance, the results may seem surprising since it appears that inexperienced companies have no need in most frequently demanded management support service elements (over all surveyed companies). However, the results can as well be interpreted in terms of an unability of these companies to estimate hurdles in complex R&D cooperation projects. This interpretation is for example supported by an empirical study of Batterink (2009) who suggests assisting companies inexperienced with inter-organisational processes. Therefore support services during the organisational initiation and administrative handling of R&D cooperation projects seems to be a latent demand rather than an active demand (Boon, 2008).

In contrast, companies without R&D cooperation experience have an active demand when it comes to the adaptation and implementation of research results within their own company. This may result in the fact that companies without R&D cooperation experience have observed R&D cooperation projects only as an external actor. On the contrary, companies with R&D cooperation experience already applied research results during the R&D cooperation project. Due to that, companies involved in R&D cooperation projects generate a competitive advantage on the one hand. On the other hand, they carry the risk of an unprofitable investment. If the subject of the R&D cooperation project contains a public benefit and the R&D cooperation consortium has applied successfully for public funds, the risk involved in innovation is minimised because of public funding.

Limitations and suggestions for further research

Based on the study sample it is difficult to finally assess if the differences on demand profiles are related (only) on the investigated company characteristics like company size and cooperation experiences. To be able to make a general statement further quantitative studies are needed since the empirical study sample in this paper is comparatively small.

Besides that, it is recommended to analyse if demand profiles might as well relate to other company characteristics or environmental circumstances in R&D cooperation projects. The presented analysis focussed on isolated company characteristics without including mutual interferences with further company features. Even if no precise distinction is evident regarding the company size, it could be assumed that more a combination of company characteristics than single company features are crucial factors for the demand of management support. The study gives incitements for further qualitative studies. The investigated features (like company size and cooperation experiences) in conjunction with other characterising features may determine required management support more in-depth.

Other characterising features could be the location within the value chain (whether a producing plant or a supplier of technologies and services) or whether, for example, companies that deliver technologies are originally concerned with another sector than the agrifood industry. To answer these questions further qualitative analyses are proposed.

Consequences for the meat industry

The generation of new knowledge, a technological driving force for the meat industry, a reduction of the time-to-market phase and with that an increase of the innovation rate is the aim of targeted R&D cooperation projects. The meat industry depends on cooperation in value chains and network probably more than any other area of the agrifood industry. Since the meat value chain is based on the division of labour, often across country borders. Business to business (BtB) and science to business (StB) cooperation are important as well for the future. The need for complex, system oriented and interorganisational innovation in the meat industry will continue. And cooperation will inspire the improvement of processes and systems within the meat industry. According to that it is likely that management support services for R&D cooperation will be much in demand in the future.

The challenge is to align targeted support services for BtB and StB cooperation. To offer companies adequate support depending on their different characteristics requires an innovation broker approach for R&D cooperation projects adapted to the demand profiles of companies in the meat industry. Based on this inquiry, it can be concluded that an innovation broker service provider should offer a whole portfolio of service elements. One would expect a flexible customer oriented performance in R&D networks.

An adapted innovation broker approach for the meat industry has already been applied by the EU Commission for the first time – in the frame of the Integrated Project 'Q-PorkChains' funded by the EU 6th framework programme. The innovation broker approach tested in the Q-PorkChains project is a promising approach for international innovation broker functions.

In the future, more effort should be given to establish a European R&D network in the meat industry which is provided with targeted management support services. By doing so, it would be desirable to integrate the presented findings in the design of an adapted innovation broker approach and as well in future research funding programmes.

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[1] To be able to classify companies in groups regarding their size, the survey examines information about the number of employees, turnover and annual balance.