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Quality Management in Supply Chain Networks - The Case of Poland

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Abstract

In this article we suggest that rising quality requirements are key factors for the re-design of food chains. We argue that the food supply proceeds through pyramidal-hierarchical strategic networks coordinated by powerful focal firms. These firms choose a quality strategy and employ chain quality management concepts by exerting managerial discretion to achieve the super-ordinate network aims. We introduce and elaborate upon two types of chain quality management: strategic and operative. The theoretical findings have been tested using evidence from the Polish dairy market. Semi-structured interviews were conducted across the various hierarchical levels of the 19 largest Polish dairy cooperatives during the spring of 2006. The results show that the firms' activities are generally aligned with current market opportunities for optimal enterprise performance. Thus, we determined that manufacturers of well-branded products create an advanced network structure and apply strategic quality management. Networks that have a focal company acting as an external customer of a processor use operative quality management. Some Polish dairies are still not embedded in any supply chain networks; no chain quality management concepts can be installed in these chains because they have no powerful focal firm.

Keywords: chain quality management, dairy cooperatives, network theory, Poland

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Introduction

Collaborative relationships in the food chain have been gaining in importance in the agro-food business for many years. Indeed, today's vertical collaborations are as important as the horizontal cooperation that emerged when the first cooperatives were established. Many factors have influenced this development in general, and particular factors are present on every level of the food chain (Duysters et al. 2004, Dyer/Nobeoka 2000, Gulatti et al. 2000). Because many articles have been written on the verticalization of the agro-food business, we refrain from analyzing it once again. Overall, there are two main factors: 1) obtaining higher efficiency due to cost reductions and 2) assuring the demanded food quality and security. In this article, we focus on quality management in vertical collaborations.

As we focus on food quality, we must bear in mind that the understanding of quality differs along the whole food chain. While food safety, freshness, taste, and animal welfare are highly relevant to consumers, retailers and manufacturers are also concerned with functional points such as production specificities and required technological parameters. Because consumers determine the marketing success of goods in saturated markets, their wishes and demands influence the entire production process (Andersen 1994, Hanf 2000). Therefore, we will place special emphasis on certain developments that are steered by consumers.

As people have become more affluent and educated about food over the past two decades, their perceptions and expectations of "good" food have changed. Consumer concerns about food quality and safety have dramatically increased by numerous food scandals such as the Coke scandal in Belgium, the Bovine Spongiform Encephalopathy (BSE) crisis in the UK, and the wine scandal in Austria and Germany (Böcker/Hanf 2000). In this context, the crisis of winter 2000-01 can be regarded as the straw that broke the camel's back. Therefore, consumers perceived BSE and Foot and Mouth Disease (FMD) as perhaps the doomsday of modern food processing. Because consumers have trouble verifying the characteristics of food safety, they, as well as politicians and the press, unanimously clamored for transparency in the whole production process. The most striking consequence of the above food scares was the fact that all agribusiness stakeholders assessed food quality as no longer being the responsibility of a single firm. Instead, it was recognized that the whole food chain needs to work together to deliver the "new quality" (Hanf/Hanf 2005).

Overall, the abovementioned incidences have catalyzed the development of quality management concepts that overlap a firm's boundaries. In recent years, a large number of proposals for "chain quality management" were widely discussed and the first quality management processes have already been implemented. Such concepts are either all-sector approaches - such as the German QS-system - or individual firms' approaches. Because all-sector approaches can only provide a competitive

advantage (if at all) for early adapters, individual approaches have to be used. In this way they can be regarded as strategic instruments for creating a unique selling proposition. Since supply chain networks now compete with each other, we argue that individual approaches have to cover the whole supply chain. Therefore, chain quality has to be used as a strategic parameter. Chain quality is a result of cooperation, so we further assume that using chain quality strategically leads to more intense relationships among partners. On the contrary if, chain quality is only used to gain parity with competing networks, weaker relationships have to be installed. Thus, chain quality management concepts are expected to significantly differ from each other.

Based on these considerations, our paper aims to work out the differences between strategic and operative chain quality management concepts and test our theoretical findings using evidence from an emerging industry. We have chosen Poland because it is a new European Union (EU) member. In that market, the firms' changing environment, including legal and voluntary obligated requirements and ongoing restructuring processes at all stages in the food chain (Pieniadz 2006) may cause unique developments, as far as quality management is concerned. In this respect, our thesis is that quality management concepts are still an emerging field and might be used as a differentiating instrument.

Our article is structured as follows. In section two we will discuss quality and its challenges and consequences for the participants of the agro-food business, and hence introduce the concept of supply chain networks. Section three deals with general demands on chain quality management. Furthermore, we introduce strategic quality chain management as well as operative quality chain management. In the fourth section we will present our empirical survey in Poland and discuss the main findings. A summary and conclusion follow.

Theoretical Considerations

Verticalization of the Agro-food Business

We have recently been able to observe that the traditional mode of exchange has been altered along the food chain. The exchange of products has traditionally been coordinated through spot market transactions; today, more and more transactions are carried out within hybrids or between vertically-integrated firms (Boehlje 1999, Brito/Roseira 2005, Fritz/Schiefer 2002, Neves 2003). Several important factors have brought this development about, such as efficiency gains through collaboration, customer requirements, etc. In this article, however, we will focus on food quality as one of the key drivers for the re-design of food chains.

Because quality is a multi-dimensional construct, different perspectives have to be analyzed (Hanf/Kühl 2004). Thus, some important implications can be drawn: (1)

quality attributes must be recognized by the customers (external customers such as consumers and business customers, as well as intra-firm customers); (2) the whole production process must be included; and (3) the product must fit the relationship-specific requirements (Garvin 1987). For developed countries, food safety can be regarded as a compulsory part of food quality.

However, food crises have alerted consumers to their inability to prove certain food products characteristics. One result has been a sharp reduction in demand for specific food items (Böcker/Hanf 2000). The aforementioned BSE/FMD crisis in the winter of 2000-01 caused a sharp reduction in the consumption of conventionally produced red meat and red meat products. Correspondingly, a sharp increase was observed in the consumption of substitutes such as fish, poultry, and cheese. Consequently, firms, as well as politicians, realized that there is an increased demand for food safety concepts.

It was assumed that the BSE problem was rooted in a malpractice at the farm-supplier level. Therefore, food safety concepts should contain information on the whole food chain, in particular, information should be provided on the monitoring and control of the whole food production process so that increasing traceability can be observed (Schulze et al. 2006, Theuvsen 2004). Furthermore, many factors - such as failing to remember, bounded rationality, asymmetric information, and time constraints - influence consumers' buying decisions. Hence, consumers will not be able, or will not be willing, to intensively and completely prove the quality of food products, although they may continue looking for signals to ease their buying decisions, e.g. for a well-known brand or a quality certificate. Therefore, it is not surprising that branded products outperformed unbranded products (Hanf/Kühl 2005). The demand for organically produced food increased significantly during the BSE/MFD crisis because those products have a trustworthy image and are certified throughout the whole production process. This demonstrates that the reliable transfer of experience and credence attributes to consumers can be used as a basis for creating a unique selling proposition, which is not a matter of food safety (Hanf/Kühl 2005).

Moreover, as there is a tendency for consumers to demand more chilled and fresh food and fruits, the processing time - from harvest to consumption - must be reduced. Thus, the time to market throughout the whole food chain is a strategic element of collaboration. For example, a well-known German discount retailer demands that their lettuce producers harvest, process, and distribute their products nationwide within twelve hours. Today's business customers also demand highly specified goods and commodities for their modern processing machines. The specifications are secured via contracting, as well as requiring specific process standards. Furthermore, total quality management concepts, "kaizen" as well as "six sigma", have shown that applying quality improvement measures along the whole supply chain leads to significant cost reductions, as well as efficiency gains.

Today's food quality demands lead to product and information flows that overlap firm boundaries as well as food chain stages. Thus, food quality is no longer the responsibility of a single firm. Instead, all directly or indirectly contributing actors of a specific food chain need to work together (Hanf/Hanf 2005). In most cases, such systems demand the formation of hybrid organizations.

Management of Vertical Collaborations

Hybrid organizations that comprise more than two firms are called networks (Menard 2002, Omta et al. 2001, Picot et al. 2001, Zylbersztajn/Farina 2003). A more detailed approach to networks is taken by Burr (1999), who classifies four types, i.e., the spontaneous network, the self-organizing network, the project-orientated network, and the strategic network. This typology is derived from the intensity of relation, the coordination mechanism, and the existence of a broker. Because food supply chains can be characterized as pyramidal-hierarchical networks, we focus on strategic networks. A focal company builds the core element of the network; it is either the manufacturer or retailer, and it is also the centralized decision-making unit (Jarillo 1988). Thus, the focal company determines the decisions of all network members, including the choice of measures, to ensure the super-ordinate network aims are met (Wildemann 1997). Because long-term explicit or implicit contracts are commonly used as governance instruments, the network actors are more or less heavily dependent on the focal company. However, the level of dependency is usually higher for vertical than for horizontal ties (Wildemann 1997).

Following the strategic network perspective, all decisions and actions of the participating firms are influenced by the purpose of collaboration, and also depend on each other (Astley 1984, Bresser/Harl 1986, Carney 1987, Edström et al. 1984). Firms can be embedded in the network through a variety of relationships, creating multiple interdependencies and partnerships; there are pooled, sequential, and reciprocal interdependencies among the partners. Lazzarini et al. (2001) propose to exert managerial discretion for sequential (vertical) interdependencies, whereas for pooled interdependencies they recommend the achievement of process standardization, and for reciprocal interdependencies they recommend coordination through mutual adjustments. Inter-organizational cooperation of such a complex network requires a great deal of coordination, and hence, cooperation management (Arbeitskreis 1995, Bogaschewsky 1995, Gulati/Singh 1998, Gulati et al. 2005). Collective network strategies must be implemented to overcome coordination difficulties that arise from the various interdependencies. Collective strategies are defined as systematic approaches by collaborating organizations, which are jointly developed and implemented (Astley/Fombrun 1983, Bresser 1989).

Partnerships are an integral aspect of chain management, especially when designed with upstream and downstream stages and supporting services that are adequate to

the network strategy. Generally, partnerships exhibit a certain degree of continuity and the focus of the relationships extends beyond price (Mentzer et al. 2000). Considering supply chain networks and the heterogeneity of their members, however, it can be expected that the optimal mode of partnerships will vary widely along the whole chain. This means that the focal company must determine partnership design. However, this does not mean that contractual arrangements or different modes of governance must be established to guide a partnership. Instead, literature reveals that the term partnership describes a multifaceted construct ranging from operational to strategic partnering (Mentzer et al. 2000, Webster 1992).

Strategic partnering is defined as an “on-going, long-term, inter-firm relationship for achieving strategic goals, which deliver value to customers and profitability to partners” (ibid. p.550). The aim of strategic partnering is to improve or entirely alter a company’s competitive position through the development of new products and technologies, as well as by creating new markets (Webster 1992). Additionally, strategic partnering should also include exclusivity and non-imitability (Mentzer et al. 2000). There is no set formula for the contracts used in case of strategic partnering. However, long-term oriented, formal and informal contracts addressing partnership-specific and relatively tight agreements dominate.

Operational partnering is defined as a “needed, short-term relationship for obtaining parity with competitors” (ibid. p.550). Thus, an operational partnering strategy seeks to improve operational efficiency and effectiveness, especially by reducing transaction costs. Such strategic orientation is manifested in employing loose contracts containing rather general information on price, quantity, and quality. Operational partnership involves shorter time spans and less organizational resources, and therefore is much easier to implement (and reverse) than strategic partnership.

Additionally, following the work of Das/Teng (2001) we assume that trust and control are inextricably interlinked with risk perception. We argue that minimizing risks such as performance (i.e., quality output) and relational risks is of paramount importance in strategic partnering. Thus, we draw a hypothesis that due to the risks-minimization objective, control intensity and costs will be much higher by strategic partnering than by operational partnering. Furthermore, we argue that as strategic partnering develops, control-based agreements will be increasingly substituted by trust-based agreements. Following the suggestions of the above-mentioned authors, relational risk can be reduced through goodwill trust, while performance risk can be minimized through competence trust.

Quality Management in Supply Chain Networks

In order to elaborate on quality management issues in the agro-food sector, we assume that the food supply proceeds in pyramidal-hierarchical strategic networks. This implies that there is a powerful focal firm in a supply chain network (SCN). This focal enterprise is able to exert managerial discretion so that the chain quality management concept has to be installed by all actors throughout the network. As a result, each must share a homogeneous understanding of quality management, which provides - at least theoretically - the preconditions of the emergence of a collective strategy, and thus collective actions, which address this strategy (Hanf/Dautzenberg 2006).

We have shown that several factors caused the changing functions of food products. However, criteria such as time to market, reliability, maintainability, and cost savings, as well as traceability, are all related to the transparency of the network structure and its business transactions. Theuvsen (2004), in his paper on transparency, divides transparency into historical, operations, and strategic transparency. Historical transparency can be supported by use of tracking and tracing systems and labeling technologies. On the operational level, transparency deals with information exchange through the network's human resources to coordinate the business activities. In this respect, division of labor and principal-agent problems can lead to information asymmetries and therefore imperfect coordination along the supply chain. Both legal and voluntary obligated standards are widely used to reduce these hold-ups. If strategic information, which corresponds to the strategic goals and visions of the SCN, and specific information such as goods in stock, scanner data, etc., are distributed within the network, Theuvsen (2004) speaks of strategic transparency.

Another essential task of quality chain management is developing a positive reputation. This can only be accomplished if the utilized leading and directing mechanism manages to create and disseminate confidence in food beyond credence attributes such as food safety. Because food quality hazards can enter the food chain at any stage, adequate control and communication throughout the network, as well as the loyalty of the supply chain partners, are essential (Das/Teng 1998, Inkpen/Tsang 2005, Uzzi 1997, Uzzi/Gillespie 2002). Therefore, the chain quality management system must be designed to include governance structures in the sense of partnering. However, depending on the internal network objective, the optimal design of the subsequent partnership structure varies for each SCN. Consequently, no discrete phase in the development of partnerships in a market can be distinguished. To overcome this inseparability, we introduce two hypothetical types of chain quality management: strategic and operative. It should be much easier to formulate an integrated and consistent management system with such a division.

We assume that a powerful focal firm in the SCN has consequences for the subsequent interdependencies within the network. In particular, the focal company has to be able to exercise managerial discretion for sequential interdependencies. Because secure food, cost efficiency, and time to market are now considered as competitive requirements (Tuten/Urban 2001, Ulaga/Eggert 2006), all chain quality management systems must address these topics. Thus, the chain quality approaches draw mainly upon standardization systems that primarily address pooled interdependencies. These systems are supplemented by standard approaches to historical transparency and operations transparency requirements. An example of industry-wide vertical standardization systems are the standards designed by the International Organization for Standardization (ISO), whereas the “International Food Standard” (IFS) or Standards of the “British Retail Consortium” (BRC) are examples of horizontal systems.

Operative quality management: This system is designed to ensure that all business operations required to meet the chosen quality strategy are effective and efficient. For this reason, two complementary measures can be used. First, mechanisms addressing historical and operational transparency, e.g. tracing and tracking systems, are used to gain parity with competing supply chain networks. Second, the network is fortified by the selection of partners. Such gains in efficiency and effectiveness are essential because consumers are not willing to pay a premium price for standard products, and the implementation and maintenance of quality assurance systems is costly. Collaborative relationships can be perpetuated over time only if the costs are offset by respective gains. Because this quality management approach aims to cut costs, an operational partnering strategy is used. Hence, the relationships are not so intensive and are not long-term.

Strategic quality management: The focal firm can try to use the operative quality management system to create long-term, enduring competitive advantages by adding strategic components. Thus, these selected partners have to accept additional quality attributes and norms higher than the basic standards. We think that special credence attributes can be used to create additional value propositions. Based on credence attributes, the subsequent strategic partnering concept is hard to imitate and the benefits are exclusive to the members of the respective SCN. A collective quality strategy must be developed to permanently establish strategic quality management. Furthermore, the management concept has to consider the arising interdependencies across diverse partnerships, as well as the strategic transparency. Additionally, trust must be established between the partners and a culture of honesty must be created to develop mutual adjustment when addressing reciprocal interdependencies. Referring to the specificity of strategic quality management, inter-firm coordination in SCN follows unique and well-defined organizational principles that can also be idiosyncratic to the network and difficult to imitate as well.

These considerations suggest that the entire SCN can be sustained and maintained while strategic quality management is practiced. However, building up and maintaining such a network requires the selection of adequate governance mechanisms, the development of inter-firm knowledge-sharing routines, and relationship-specific investments and initiatives for necessary changes in the partnership structure (Dyer/Singh 1998). This all means that any focal actor must first compare the benefits and costs of the alternative quality management schemes and hence network structures. Thus, neither operative nor strategic quality management is better. The critical point is to choose the quality approach which best fits the overall network aims and its performance. Thus, operative quality management is usually the right approach for a cost leadership strategy, whereas a strategic quality management approach is usually best for a differentiating strategy.

Relevance of Chain Quality Management in Poland

In this section, we test our theoretical framework on chain quality management in the Polish dairy sector. Thus, we analyze (i) the type of prevailing quality understanding, as well as which quality schemes are used, (ii) the types of relationships that are present, and (iii) whether firm boundaries overlapping collective quality strategies exist.

Data and Methods

We surveyed 19 of the 22 largest Polish dairy cooperatives during February and March 2006. Roughly equal numbers of semi-structured interviews were conducted across the different hierarchical levels in the coops, including chief executive officers, quality managers, and supervisors in the marketing and supply departments. The sequence of the questioned representatives was the same for each coop. The interviews were conducted by telephone and lasted between 20 and 40 minutes per respondent. Details on the participating firms can be found in the appendix (tables 1 and 2).

The applied technique makes particular sense in view of the abovementioned research questions. On the one hand, chain quality management, as well as networks, concern activities and processes that are not easy to quantify and may even be ambiguous or misunderstood. On the other hand, the topics are particularly sensitive in emerging markets. Moreover, in those markets we expect some unique and relevant developments, which must be first recognized, while at the same time giving the respondents some freedom to explore our general views. Understanding the peculiarities of the investigated sample is crucial, since it allows for refining our theoretical assumptions, and hence a better interpretation of the findings. Following the inductive approach of Patton (2002) we began our analysis by collecting the perceptions of each representative in a dairy regarding the

abovementioned research questions (i-iii). The primary emphasis was on in-depth understanding of each individual case and on defining a set of all possible outcomes before those unique cases were compared and grouped. Thus, to obtain a first insight on the strategic orientation of a coop, we began with the opinions, perceptions and visions of the chief executive officer who represented the decision-making unit. Next, all other respondents of a coop were invited to express their views regarding the general questions (i-iii). However, focus was placed on gathering detailed information concerning the corresponding department. For example, supply department supervisors were asked a number of open-end questions regarding: the design and intensity of relationships at the procurement stage, i.e., duration, stability and sustainability of the supplier-processor relationships; existing forms of commitments (agreements, implicit/ explicit contracts); intensity and topic of consulting and financial assistance (i.e., shared investments), and finally, issues regarding quality assurance (risk perception, control and trust, quality-related payment schemes).

We considered two dimensions of quality management (operative and strategic) as being opposite ends of a spectrum. The applied inductive approach allowed us to identify the indicators of the two poles by complementing the theoretical hypothesis with the empirical findings. Thus, in the second stage of the analysis we clustered the identified indicators and obtained a polar space defined by operative and strategic quality managements.

The key indicator that marks operational quality management is the network aim of gaining parity with the competing networks regarding food quality. This strategic orientation is often accompanied by the aim of achieving cost leadership, meaning that generic products are provided at the cheapest possible prices and all products are non-premium brands. The standardization systems address history and operation transparency requirements (i.e., IFS, ISO 9000). The relationships are short- or medium-term and operational partnering schemes dominate both the downstream and the upstream stages (transaction costs reduction). The parties apply either loose, flexible long-term contracts or detailed short-term contracts. In the case of loose contracts, the agreements fix the duration of partnership, payment schemes and general quality requirements, but leave the amount or composition of delivery, as well as the price, to be ongoing adjusted. Short-term contracts are rather explicit and detailed, covering many specifications, with quality and timely delivery being of paramount importance.

The first identifiable pattern that can be 'generalized' in the case of strategic quality management is the existence of a collective chain quality strategy. This system is designed to create long-term, enduring competitive advantages using quality as a differentiating parameter. Thus, the strategy is indicated by the existence of additional quality attributes (credence) exceeding domestic consumer needs (environmental, social justice) or the creation of premium brands. The applied

quality assurance schemes are higher than basic standards. The parties develop and maintain unique partnership concepts, which are hard to imitate. Some indicators are long-term collaborations, shared and relationship-specific investments, mutuality, strategic transparency, a high level of control/trust to minimize risk, co-marketing (at the distribution stage) and the provision of business angels (at the procurement stage). The applied contracts are long-term and address both partnership-specific and relatively tight agreements (at the distribution stage) or cover rather strategic issues and are not so detailed (at the procurement stage). More details on the corresponding sets of indicators are reported in Table 3, in the appendix.

In the third stage of the research, we identified three groups of coops that shared similar brand orientation or choice of the distribution channel. Furthermore, for each group we determined the chosen chain quality management.

General Findings

Because we analyze the SCN from the cooperative's point of view, we consider it as an integrator in the chain and concentrate on its relationships with the upstream (procurement) and downstream (distribution) collaborators. Thus, we will discuss vertical cooperation in the context of the various strategic settings.

All cooperatives must grow to stay in the market place. However, they apply different strategies. To overcome the competition they modify their production profile, which leads to a kind of market segmentation and mitigates direct rivalry among firms. Basically, they move toward specialization on either the white or yellow production line or they extend their production to offer highly diversified goods of both lines. The interviews indicate that firms use both cost-leadership, and to varying degrees, product differentiation strategies. Because Poland is still one of the poorer OECD countries, cost orientation is regarded as a competitive necessity for all coops. However, because there is an increasing income disparity among Polish consumers, the market segregation process is being strengthened, which leads to an evolution of various marketing strategies among the cooperatives. Thus, on the one hand, the majority of dairies are still rather unbranded, but on the other hand, they hold some of the best-known Polish "fast-moving consumer goods" brands. This variety is also mirrored in the distribution process of the dairy products. Either the products are sold through retailers (supermarket and discount chains and local supermarkets) or they are traded to wholesalers, who distribute them to the retailers. Less often, coops sell their products to industrial customers for further processing or catering services.

Catalyzed by the high pressure of downstream stages, almost all dairies comply with mandatory EU standards such as the hygiene standards currently stipulated in regulations (EC) No. 852/2004 and 853/2004. However, three plants have still not

adjusted to those standards; they were granted a transitional period until the end of 2006 to accomplish all needed modernizations. Procedures based on the concept of Hazard Analysis and Critical Control Point (HACCP) are widely used to minimize the risks of food safety hazards and to facilitate adherence to the mandatory minimum quality standards. All of the investigated plants have already installed the HACCP system, most of them even before EU accession (2004). However, implementing that concept has been compulsory for all food business operators in the EU since January 2006. Thus, the competitive advantages of HACCP implementation have been gained solely by early adopters, who can currently benefit from cost savings and learning experiences. Besides the mandatory food safety standards, voluntary (public and private) quality schemes are used by most of the investigated dairies. Schemes in use are ISO 9001:2000, ISO 14001, BRC, IFS, and some national concepts. Four coops declared ongoing adjustment processes to introduce the food safety management system ISO 22000:2005. Two other firms produce kosher food, which require its own quality schemes. The investigated group outperforms the sectoral average as far as the implementation of the private quality schemes is concerned. However, once the schemes are used throughout the market, they become less relevant as competitive strategies. Furthermore, those schemes operate within the chain, but the consumer may not be aware of their existence at the point of final food purchase. This drives the coops to develop and strengthen their brands. All coops understand quality as a mechanism to reach the needs and wants of consumers. This indicates that food quality in Poland is more than plain food safety and the ability to continuously reproduce an ex ante defined set of attributes.

Relationships at the distribution stage vary from loose or tacit agreements that are almost spot market transactions, to stable, long-term, and trust-based contracts. Usually the partnership between a coop, export companies, wholesalers, and local independent supermarkets or outlets has a strict operational character, whereas partnership with retail chains or manufacturers with foreign investments is a more strategic one. Though relationships to downstream business partners are fairly heterogeneous for each coop, not surprisingly, the relationships with farmers, almost all of them being members, show some similarities among cooperatives. Besides information transfer between the coop and the farmers (consulting, choice of production techniques), the coops offer their members credits or access to credits for investments in growth and specialization of the farms. For example, coops use quality-dependent payment schemes to achieve better raw milk quality. Additional provisions also exist, including a price premium for extraordinary quality (super extra), and direct delivery for veterinary bureau-approved farms, or farms which possess certain breeds of milk cows.

All cooperatives pay a price premium on membership. Consequently, payment schemes differ greatly between firms. However, in all pricing mechanisms, the price increases as compliance with quality requirements set by the purchaser increases.

Although the formal design of the relationships with their members appear very similar, significant differences in the intensity of the relationships were found.

Operative or Strategic Quality Management?

Even though all coops had an explicit corporate strategy, including topics on member's relationships, there is no empirical evidence of an explicit collective strategy covering all stages of the food chain. However, results indicate that there is a link between the chosen quality strategy, the dominant distribution channel, the design of the respective partnerships, and the applied quality management scheme. We define a distribution channel as dominant if a firm sells more than 70% of its product through that channel. In this respect, we were able to distinguish three main groups of firms in the sample: (1) coops that do not have a strong brand and mostly deliver directly to retailers and an industrial purchaser with foreign direct investment; (2) coops with strong brands; (3) coops of non-branded goods or those with weak brands, with wholesalers being the main purchaser. A concrete example of each group can be found in the appendix. And even though these three coops are individual cases, they mirror the particularities of each group.

Group 1:

Because most of the coops do not have strong brands and therefore do not have to carry the chain responsibility, we do not consider them as focal companies. In this case, direct purchasers (retailers and manufacturer) are the focal companies. Therefore, coops regard direct purchasers as the standard-setting entities and adjust their quality strategies and management schemes as required. In these cases, cooperatives have to meet - at least - all mandatory quality standards and schemes.

- a. If a coop supplies a highly-specialized industrial customer, specific quality requirements have to be met (i.e., unique chemical or physical parameters). We found that the partners jointly carried out many of the relation-specific investments, which first concerned quality improvements at the procurement stage, and then the adoption of new processing technologies. Adherence to the specific requirements is ensured by close business-to-business (B2B) relations, including some knowledge sharing routines and enhanced monitoring. Additionally, in such direct relationships the threat of direct and strong sanctions (losing the focal purchaser) limits opportunistic behavior and facilitates cooperative adaptation by the coop. At the same time, the high intensity of unexpected controls and enhanced monitoring suggests that the focal firm either does not trust the partner or must steadily improve its knowledge about the partner's capability, as well as the correctness of the process.

- b. If a dairy sells its products to a retail chain and the retailer then sells them as proprietary private label products, implementing retailer-specific schemes will be required. Thus, processors are obliged to voluntarily implement standards for auditing retailer-branded food products, such as IFS and BRC. Interestingly, retailers are satisfied if those concepts are running but do not need to be certified, which seems to be specific for an emerging market. In this case, quality standards are used to coordinate pooled interdependencies. We found that focal firms prefer control-based relationships rather than trust-based ones to govern partnership behaviors and the maintenance of their specific requirements. In particular, retailers with strong bargaining power apply restrictive control mechanisms, even if the running quality concepts are certified. Adjustment to the retailer-specific requirements involves investing in specialized resources, which increases the coops' dependence on retailers. However, because IFS and BRC are widely used standards, the coops have formal access to alternative institutional customers on the national or international markets.

Contracts and managerial discretion are used to meet sequential interdependencies. The contracts contain specifics on quality and payment. As long as these specifics are met, the duration is prolonged. Additionally, we found some reciprocal interdependencies among the partners in B2B relationships between the coops and the industrial purchaser. Overall, the relationships between the focal companies and the dairies are very intense. Therefore, the type of partnering is more strategic than operational.

Regarding the relationship between coops and their members, we found that the coops encourage growth strategies by intensive consulting assistance aimed at selecting larger farmers. Overall, we conclude that supply chain networks are established and chain quality management is exercised. However, even though the partnering can be described as more strategic in nature, there is a lack of a collective quality strategy. Thus, we would classify the paradigm as operational chain quality management. Because more and more retailers are bringing their proprietary private label products to the market, there exists increasing price competition among the products. For the concerned coops, this means that they face strong pressure on costs, which precludes resource allocation to more sophisticated quality management systems.

Group 2:

When cooperatives dispose of a strong brand they adopt the network position of a focal company. Because Polish consumers appreciate the freshness, taste, and safety and reliability of well-branded food products, credence attributes such as environmental friendliness or animal welfare are of minor strategic importance. Nonetheless, the coops have recognized that they must actively design their

distribution opportunities. For all channels – retail, wholesale, and export – they use medium- and long-term contracts, which contain many details addressing product quality matters. Thus, the coops control, to some extent, quality measurements that are external to the firm.

Moreover, coops use partnering mechanisms that are more strategic in nature, so marketing information such as point-of-sale data is exchanged. Co-marketing is particularly intensive in partnerships with retail chains, because it is based on ongoing negotiations and adjustments addressing sales strategies, promotions, and pricing behavior. Typically, this leads to complex reciprocal interdependencies, which demand well-defined organizational principles and a certain level of management skills to govern the relationships. Such relation-specific systems seem to be unique to individual chains of branded products manufacturers.

All mandatory standards and schemes are implemented because the brands stand for high quality. However, the use of private standards is not as homogenous. While all manufacturers of branded products use intensive ISO quality standards, only three coops have implemented ISO standards on environmental management and possess an adequate certificate that integrates both systems. Respondents of those coops stressed that the main incentive for implementing the voluntary environmental standards was to demonstrate their environmental concerns, and hence to increase their reputation and brand loyalty. However, all of the coops declared an intention to implement the environmental standards in the near future for the same reason.

Interaction at the procurement stage can also be described as intensive. Using incentives to upgrade the quality of raw milk, coops exert a firm boundary overlapping quality schemes. Some of the actions result from the implementation of ISO quality standards, which require objectives for quality to be included in the quality policy and to be leveraged to the upstream stages. Additionally, the coops provide intensive consulting assistance and herd management for their members. One coop even provided business angles as an alternative know-how source (technology transfer) as early as the beginning of the 1990s. In this case we can consider it as a strategic chain quality concept.

Group 3:

This group contains processors of non-branded goods or those with weak brands sold mainly to wholesalers and local independent retailers, such as small supermarkets and outlets. The relationships between coops and those direct purchasers cannot be described as being of a collaborative nature. Instead, arm-length, traditional, spot market transactions dominate. Typically, loose contracts are used for dealing with financial matters as well as some basic quality matters such as the product

expiration date. Therefore, because there is no chain network there is also no chain quality management.

The dairies are usually 'white line' manufacturers and emphasize offering their products at the cheapest price (price leadership). This requires a strong cost orientation, with cost leadership being achieved by economies of scale, producing basic products, and improving the efficiency of all business operations, i.e., by partners' selection. Because there is no dominant standard-setting purchaser, the dairies have some freedom in their choice of quality strategies and measures to guarantee the effectiveness of those strategies. Because of this strong cost orientation, it is not surprising that the processors apply mandatory standards and schemes and restrict their relationships with suppliers to basic commitments and principals as regulated in the cooperatives' act. Nevertheless, the coops' relationships seem to be better developed at the procurement stage than at the distribution stage. We identified operational partnerships between the coops and their milk suppliers, as well as some dyadic actions addressing the chosen quality strategy at this stage, but the recognition of similar interests and initiatives to explore even operational advantages in relationships with their institutional customers is still lacking.

Even though the dairies rely on cost leadership for their competitive advantage, they have to deliver safe and reliable food and differentiate the products at least in a minor way to make them more attractive for the consumer. Because the firms do not possess a strong brand, they use voluntary public quality certifications and labels to signal quality. Dairies commonly use standards developed and assigned by the Polish Center for Testing and Certification (PCBC), such as "Q" (quality) and Eco" (ecological), as well as "PN" (the product and process conform with the Polish norms). Some standards promote national food products of high and reliable quality, such as the "Try Fine Food" standards (PDZ) designed by the Polish Ministry of Agriculture and Rural Development. However, the relevance of those signals is decreasing as well-known retailers establish private labels and manufacturers' brands in the market.

Still, coops belonging to the third group can gain attractive profits, although price competition is increasing. The ongoing development of retailers and wholesalers with strong bargaining power will force the dairies to either join their SCN or take the role of a focal company, and hence to strengthen their own brand. Independent of that, the dairy must first create its supply chain network and develop a chain quality management.

Summary and Conclusions

Nowadays, food is perceived as a complex bundle of characteristics, with an increasing level of importance placed on credence attributes relating to product and

methods of food production (e.g. environmental friendliness). Food processors and retailers must re-design their food chains in such a way that all stages are involved in meeting the requested 'new quality.' Therefore, the coordination mechanisms of existing food chains have to be altered, because spot market transactions are unable to properly coordinate the exchange of credence attributes. These must be substituted by transactions in vertically-coordinated chain organizations. Such higher coordinated chain organizations are either hybrids or vertically-integrated firms. There is evidence that the majority of these agro-food chain systems are organized as vertical networks, i.e., supply chain networks.

Supply chain networks are strategic networks that demand a collective strategy and common chain management. Chain management must incorporate the relationships and interdependencies of the member firms, as well as problems arising at the firm level, the dyadic level, and the network level. In this article, we have differentiated between operative chain quality management and strategic chain quality management.

Operative chain quality approaches address food safety and risk issues as well as efficiency issues. The operative chain quality management systems pursue the paramount objective of minimizing health safety risks caused by food contamination. Chain-adapted standardization systems such as ISO, QS, and IFS are used for this purpose. Operative approaches are mainly tools for achieving parity with competing SCNs, whereas a strategic chain quality system can be used to achieve a qualitative competitive advantage. Strategic chain quality management considers additional quality attributes, which are credence characteristics. However, we do not argue that every SCN needs strategic chain management; rather, only if a SCN has a strategic aim such as being a trusted brand. Thus, the challenge for the focal firm is to choose that quality approach which best fits its overall network aims and performance.

In emerging markets, limited consumer demand for high quality goods, especially for credence attributes, is still the main barrier for upgrading quality management systems. At the same time, firms in those markets face high adjustment costs due to the changing market environment, including legally and voluntarily obliged requirements, and ongoing restructuring processes at the procurement and distribution stage. Both effects facilitate the strong cost orientation of the firms, and hence the tendency to apply and remain with the operative quality management.

The example of the Polish dairy market shows that firms' activities are generally aligned with current market opportunities for optimal enterprise performance. All firms must deliver safe and reliable food and differentiate the products at least in a minor way to make them more attractive to the consumer. Overall, we conclude that in most cases, supply chain networks are established and chain quality

management is exercised. However, this is only the case if there is a focal actor that influences its network structure. The results show that retail chains and industrial purchasers with foreign investment and strong bargaining power usually take the position of the focal firm in the SCN. In those cases, strategic partnering between the individual chain stages dominates. However, because there is a lack of a collective quality strategy overlapping all actors in this case, the quality management initiatives are still operational.

Furthermore, there is evidence that Polish manufacturers of well-branded products can adopt the position of the focal firm in the SCN as well. Thus, those dairies must carry the chain responsibility for quality. For this reason, they apply more sophisticated quality assurance schemes and use governance mechanisms, which are unique for an individual chain and usually strategic in nature. As a strategic center, the processors focus on the chosen quality strategy and clearly guide the partnership in arms-length ties at the procurement and distribution stages. Thus, a collective quality strategy is observed. Overall, we conclude that manufacturers of well-branded products in Poland perform strategic quality management. These findings confirm our theoretical considerations and indicate that the behavior of those firms is universal, and holds for both mature and emerging industries. There are still some Polish dairies that are not embedded in any SCN. These concern processors of non-branded goods or those with weak brands who sell their products to purchasers without a focal position. Because there is no powerful focal firm in the chain, no managerial discretion can be exerted and no chain quality management concepts can be installed. Thus, we could only identify operational partnerships between the coops and their milk suppliers, and some dyadic actions addressing the chosen quality strategy at the procurement stage. In contrast, at the distribution stage we observed that the partners do not share homogenous interests regarding quality issues; there is even a lack of dyadic initiatives that aim to explore the operational advantages of the cooperation.

However, even those dairies not embedded in a SCN have recognized the importance of quality for their market success. Because of the strong cost orientation, the processors continue to apply mandatory standards and often use public labels and certificates to signal their quality. Attractive profits are still possible with this strategy, but the increasing price competition among the basic products and the further development of retailers and wholesalers with strong bargaining power will force the dairies either to join their SCN or to take the role of a focal company and strengthen their brand. Independent of that, the dairy first must create its supply chain network and develop a chain quality management. Our empirical results indicate that a profound diversity of quality management approaches exist among Polish milk supply chains. However, one thing is unambiguous: the chosen quality strategy determines the design of the vertical coordination mechanism. Thus, the higher the product requirements, the further

quality management systems go beyond a firm's boundaries and the stronger is the shift from operational towards strategic quality management.

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Appendix: A

Table 1: Relevance of the investigated sample for the Polish dairy industry in 2005

	Milk procurement	Revenue*	No. of plants	No. of Employees	No. of milk suppliers
Sample	3,537 million liters	1,213 million Euro	42	9,962	71,278
Share in the industry	41%	31%	14%	25%	24%

Source: Interviewed sample of 19 Polish milk cooperatives, ARR (2006), ZPPM (2005), KZSM (2005), GUS (2006).

Note: Data for 2004.

Table 2: Structure of the investigated sample

Distribution structure							
Share of sales for individual channels						Share of retailers' own labels	
Export	Retail chains	Wholesalers	Industry	Small independent outlets			
Minimum	0.01	0.00	0.02	0.00	0.00	0.00	
Mean	0.25	0.26	0.33	0.11	0.50	0.12	
Maximum	0.90	0.58	0.89	0.80	0.25	0.58	
Procurement stage							
Share of direct deliveries to the coops			Share of EU-conforming raw milk at procurement ¹⁾				
	Procured milk	Milk holdings					
Minimum	0.40	0.10			0.90		
Mean	0.44	0.76			0.96		
Maximum	1.00	1.00			0.99		
Quality standards and schemes							
No. of plants adequately certified	Mandatory			Voluntary			
	Hygiene standards ¹⁾	HACCP	ISO 9001	ISO 14001	BRC	IFS	Kosher
	39	24	14	4	1	1	2

Source: Interviewed sample of 19 Polish milk cooperatives.

Note: Hygiene standards and rules for production and marketing of raw milk and milk-based products as regulated in Council Directive 92/46/ECC until 31 December 2005 and in the regulations (EC) No. 852/2004 and 853/2004 since January 2006.

Table 3: Indicators for operative and strategic quality management

	Operative quality management	Strategic quality management
Aim of the SCN	<ul style="list-style-type: none"> - to gain parity with competing networks regarding food quality - to achieve cost leadership & provide generic products at cheapest possible price 	<ul style="list-style-type: none"> - to create long-term, enduring competitive advantages, using quality as differentiating parameters - to provide unique quality/product innovations
Quality understanding	<p style="text-align: center;"><i>basic</i></p> <ul style="list-style-type: none"> - safety, reliability & maintainability of final products - first understanding, thereafter meeting customer preferences - lack of a collective quality strategy 	<p style="text-align: center;"><i>high</i></p> <ul style="list-style-type: none"> - additional quality attributes (credence, tradition) - exceeding consumer needs (environmental, social justice) - generating new demand (market segmentation via new brands development) - collective quality strategy given
Branding/ labeling	<ul style="list-style-type: none"> - no/ weak brand; generic products - public quality certificates and labels dominate, i.e., "PN"-label indicating that the product and process conform with Polish norms or "Try Fine Food" standards (PDZ) 	<ul style="list-style-type: none"> - premium brands, brand management given - investments in brand, reputation and reduction of information asymmetry about product quality (social marketing, TV adverts, food exhibitions)
Quality standards and schemes	<p style="text-align: center;"><i>minimum quality standards</i></p> <ul style="list-style-type: none"> - mandatory hygiene standards as regulated by the EU, i.e., CD 92/46 or (EC) 853/2004 - mandatory food safety programs (HACCP) - standardization systems addressing history and operations transparency requirements (IFS, ISO 9000); the concepts are running, but are often not certified 	<p style="text-align: center;"><i>superior norms/value-adding schemes</i></p> <ul style="list-style-type: none"> - earlier standards-adopter - certificates of ISO standards on environmental & quality management (ISO 14001, ISO 9001) - intention to introduce up-to-date food safety systems (HACCP/ISO 22000) - standardization systems addressing strategic transparency requirements (kosher food, industry outperforming activities regarding processing of GMO-free materials, purchaser-specific concepts)
Relationship design ...generally	<ul style="list-style-type: none"> - short- or medium-term - operating partnering schemes dominate - low intensity of relationships - control-based relationships dominate 	<ul style="list-style-type: none"> - on-going, long-term - unique partnering concept/hard to imitate - mutuality (mutual adjustments, shared relationship-specific investments, knowledge sharing routines, cooperation management) - high level of control/trust to risk minimization, however, trust based-relationships dominate
...at the distribution stage	<p style="text-align: center;"><i>Partnering</i></p> <ul style="list-style-type: none"> - short- and medium-term, unstable - restrictive control mechanisms exercised by the focal company (retailers) <p style="text-align: center;"><i>Contracts</i></p> <ul style="list-style-type: none"> - loose, flexible, long-term, formal (fixed terms: partnership duration, payment schemes, general quality requirements; flexible terms: amount/composition of delivery, price) - short-term contracts (rather explicit, detailed, cover many specifications; quality and timely delivery are of paramount importance) 	<p style="text-align: center;"><i>Partnering</i></p> <ul style="list-style-type: none"> - intensive - co-marketing - ongoing negotiations and adjustments addressing sales strategies (exchange of point-of-sale data, promotions, pricing behavior) <p style="text-align: center;"><i>Contracts</i></p> <ul style="list-style-type: none"> - medium- and long-term, formal, address both partnership-specific and relatively tight agreements
...at the procurement stage	<p style="text-align: center;"><i>Partnering</i></p> <ul style="list-style-type: none"> - basic intensity as regulated in a coop act (consulting assistance, financial support) - short-term economic incentives regarding milk quality improvements dominate (price premium for meeting mandatory quality standards, credits for milking & milk cooling equipment) <p style="text-align: center;"><i>Contracts</i></p> <ul style="list-style-type: none"> - medium-term, formal, delivery contracts (minimum quantity and quality of delivery, payment schemes, basic responsibilities and rights as regulated in a coop act) 	<p style="text-align: center;"><i>Partnering</i></p> <ul style="list-style-type: none"> - sustainable, long-term collaborations (shared investments, well-developed feedback mechanisms, business angels, herd management) - high degree of mutual loyalty (sample out trust level of goodwill and competence, trust) - additional incentives to upgrade the raw milk quality (price premium for superior milk quality, markdown for no valid quality certificates) <p style="text-align: center;"><i>Contracts</i></p> <ul style="list-style-type: none"> - no formal (delivery) contracts or indefinite collaboration contracts covering strategic issues and addressing principles set in the respective coop act

Source: Interviewed sample of 19 Polish milk cooperatives.

Appendix: B

1st group (1a)		Example of SCN performing operative quality management		Survey: Polish cooperatives March 2006										
Competitive strategy Specialisation: yellow line Cost orientation Economies of scale Focus on one product (cheddar) and one business customer Modernisation, mechanisation of the technological process Improving efficiency of all business operations, i.e. by partners' selection No brand management (costs)			Growth strategy <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td style="text-align: center;">Present products</td> <td style="text-align: center;">New products</td> </tr> <tr> <td style="text-align: center;">Present markets</td> <td>Hard cheese / Germany hard cheese / Poland</td> <td style="text-align: center;">/</td> </tr> <tr> <td style="text-align: center;">New markets</td> <td style="text-align: center;">/</td> <td style="text-align: center;">/</td> </tr> </table>				Present products	New products	Present markets	Hard cheese / Germany hard cheese / Poland	/	New markets	/	/
	Present products	New products												
Present markets	Hard cheese / Germany hard cheese / Poland	/												
New markets	/	/												
Quality understanding of the co-op safety / stability To understand / reach customer preferences To outperform customer preferences To generate the demand ----- X														
Branding														
Retailers' private labels	Co-op's own brand	No-name, single brand												
No	Brand message	Company name and logo, safety, objective quality attributes (i.e. reliability and maintainability of final products, technological parameters of paramount importance)												
	Brand recognition/ spread	Small / regional in central Poland												
Relationships at the distribution stage / dominating business customers														
Industry	80%	Term of contracts	Short-term long-term X unlimited											
7/8 of it → one customer with foreign investment being focal company		Content of contracts	Loose agreements X explicit, high requirements											
		Partnering	Operative	X	Strategic									
Export	15%	Term of contracts	Short-term X long-term unlimited											
Product: hard cheese		Content of contracts	Loose agreements X explicit, high requirements											
Country: Germany, USA, Canada		Partnering	Operative	X	Strategic									
Wholesalers	< 3%	Term of contracts	Short-term X long-term unlimited											
(dominates Makro)		Content of contracts	Loose agreements X explicit, high requirements											
		Partnering	Operative	X	Strategic									
Quality standards and schemes														
	Mandatory		Voluntary											
	Hygiene standards as reg. in CD 92/46 or (EC) 853/2004	HACCP	ISO 9002	ISO 9001	ISO 14001	BRC IFS								
Implemented	2003	2003	No	No	"No, however in far future"	No No								
Certified	2003	2005												
Further standards	Technology specific quality standards of the main industrial customer, i.e. chemical, physical parameters Quality label of the German Agricultural Society (DLG); important quality signal, since Germany is the main export country GMO free: industry outperforming activities in the field of processing of GMO-free materials													
Relationships at the procurement stage / milk suppliers														
Intensity of consulting assistance	Basic as regulated in a co-op act		2	3	large milk suppliers									
credits	Purpose	milk cooling equipment	milking equipment	Operating recourses	Purchase of certain breeds of heifer									
	Financing	Co-op-own capital		Public funds	Strategic partner									
Quality-related payment scheme for raw milk	Basic as regulated in a co-op act	Markdown for no valid/ no possessing of quality certificates	premium for direct delivery	premium for possessing a certain breed of milk cows										
Partnering	Operative	X	Strategic											
However, only with large milk suppliers														
Co-op characteristic	No. of employees	187	∅ Delivery / supplier:	42.000 l milk per year										
	No. of plants	1	Share of direct deliveries:	53% of all milk holdings										
	Milk procurement:	118 million litre p.a.		82% of total milk procurement										
	No. of milk suppliers:	2.800	Contracts:	posses 80% of milk suppliers (formal, medium-term delivery cont.)										

2 nd group		Example of SCN performing strategic quality management		Survey: Polish cooperatives March 2006	
Competitive strategy		Growth strategy			
Specialisation: white line		Present products		New products	
Product differentiation		Present markets		New products: hard cheese Product modifications: cottage cheese, crème cheese	
Cost orientation		New markets		/	
Quality production Premium brand Product Innovations Earlier standards adopter		cottage cheese / Poland			
Economies of scale Focus on white line production Cost savings due to early adoption of higher technologies		cottage cheese / Czech Republic, Slovak Republic			
Quality understanding of the co-op					
safety / stability To understand / reach customer preferences To outperform customer preferences To generate the demand -----X----->					
Branding					
Retailers' private labels 4.5% of the coop's produce		Co-op's own brand Strong, single brand, focal company			
		Brand message		Company name, signal for high product quality (i.e. taste, freshness, safety, reliability, environmental friendliness, social justice), and long tradition of high quality production and brand image	
		Brand recognition/ spread		High / Poland	
Relationships at the distribution stage / dominating business customers					
Retail chains 50%		Term of contracts		Short-term -----X----- long-term ----- unlimited	
almost all chains in Poland, i.e. Tesco, Real, Auchan, Carrefour, E'Leclerc, Geant, Biedronka		Content of contracts		Loose agreements -----X----- explicit, high requirements	
		Partnering		Operative X Strategic	
Wholesalers 48%		Term of contracts		Short-term -----X----- long-term ----- unlimited	
		Content of contracts		Loose agreements -----X----- explicit, high requirements	
		Partnering		Operative X Strategic	
Export <1%		Term of contracts		Short-term -----X----- long-term ----- unlimited	
		Content of contracts		Loose agreements -----X----- explicit, high requirements	
		Partnering		Operative X Strategic	
Quality standards and schemes					
		Mandatory		Voluntary	
		Hygiene standards as reg. in CD 92/46 or (EC) 853/2004		HACCP ISO 9002 ISO 9001 ISO 14001 BRC IFS	
Implemented		2001 by few production lines 2003 by all production lines		1997 1999 2003 No No	
Certified		2003		1997 2002 2003	
Further standards		Two national public quality certificates and labels, granted for the co-op's cottage cheese: "Q"-label, indicating extraordinary quality, assigned in 2001 by the Polish Centre for Testing and Certification (PCBC) "Try Fine Food" label (PDZ), assigned in 2000 by the Polish Ministry of Agriculture and Rural Development. However, the intention of the co-op is to invest in its own brand in the future rather than to invest in maintaining of those public certificates			
Relationships at the procurement stage / milk suppliers					
Intensity of consulting assistance		Basic as regulated in a co-op act 2 3 4		large milk suppliers are preferred	
credits		Purpose		milk cooling equipment milking equipment Purchase of certain breeds of heifer Direct investment in the dairy holdings	
		Financing		Co-op-own capital Public funds Assistance by application for bank credits	
Quality-related payment scheme for raw milk		Basic as regulated in a co-op act		Markdown for no valid/ no possession of quality certificates premium for possessing a certain breeds of milk cows premium for extraordinary milk quality	
		Partnering		Operative X Strategic	
Co-op characteristic		No. of employees 340		∅ Delivery / supplier: 62,000 l milk per year	
		No. of plants 1		Share of direct deliveries: 45% of all milk holdings	
		Milk procurement: 111 million litre p.a.		76% of total milk procurement	
		No. of milk suppliers: 1,800		Contracts: posses 40% of milk suppliers (indefinite collaboration contracts)	

