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(Dis)loyalty in the German dairy industry:
A supplier relationship management view
Empirical evidence and management implications

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1 Introduction

During the last decades there have been many empirical and theoretical attempts to approach the question of how to build and maintain stable, long-term relationships (Hennig-Thurau and Hansen, 2000; Andaleeb, 1996). In neoclassical analysis, one would typically argue that the decision to whom to deliver one's products or from whom to buy them is only based on price. The perception that the homo oeconomicus is no appropriate idea of man for the analysis of enduring business relationships, however, is not new (Heide, 1994). Today, it is widely accepted that behavioural aspects such as commitment and loyalty also play an important role in economic exchanges.

Agribusiness firms, however, are only slowly realizing what Morgan and Hunt (1994, p. 20) stated more than a decade ago: "To be an effective competitor (in the global economy) requires one to be a trusted cooperator (in one network)." Strategic partnerships or alliances, which traditionally are in the focus of channel marketing, are certainly not appropriate, since there is a multitude of farmer-suppliers all delivering the same product. The situation thus is quite different in agribusiness compared to other industries. Nevertheless, based on recent developments and reports from Germany (AgraEurope, 2007; LZ, 2007) and other countries such as the USA (Zeuli and Bentancor, 2005) or Great Britain (MDC, 2005), the authors hypothesize that farmers' loyalty to their customers will be of increased importance in the future.

Thus, measures of supplier retention are needed to retain the suppliers and stabilize the supply bases. In the channel literature, long-term relationships are only analyzed in a dyadic context, focussed on partnerships between two parties (Stölzle, 1999). In agribusiness, however, processors have to deal with a high number of (small) suppliers, hindering the establishment of personal relationships. Network approaches thus seem to be more appropriate. In this study we try to combine knowledge from both research streams.

This research therefore was aimed to shed light on factors affecting supplier commitment and loyalty in agribusiness, taking the dairy sector as an example. The question we are hoping to answer is: What determines farmers' loyalty towards industrial buyers? Therefore, the extant body of literature on channel marketing, organisational behaviour, consumer behaviour, social exchange theory, and agribusiness research is reviewed.

This paper is organized as follows. In the next chapter, the characteristics of German milk production and dairy industry are delineated to introduce the reader to this specific business context. Then, a literature overview is given. Different definitions of loyalty and commitment as well as outcomes and antecedents of these constructs are discussed and hypotheses also are developed. The research model is presented at the end of this chapter. It is tested via structural equation modelling using a sample of 251 German dairy farmers. Methodology and results are discussed in the following chapters, leading to some conclusions on theoretical and practical implications as well as hints to limitations of the study.

2 Industry structure and design of relationships: state of the art and perspectives in the German dairy sector

2.1 Structure of dairy production and dairy industry in Germany

Germany is the most important milk producing country within the EU, accounting for nearly 20 % of total EU milk production. The number of milk farmers has decreased by 60.4 % from 278,000 in 1990 to 110,000 in 2005. Nevertheless, the average number of cows per farm is only 38 (ZMP, 2006). This is quite small compared to other relevant EU-milk producing countries such as the UK which has an average herd size of 79 per farm.

The processing level is also facing considerable structural changes. Within the last 16 years, the number of dairies in Germany has decreased by 71.9 % from 360 in 1990 to 101 in 2006 (MIV, 2007). Even though with 101 enterprises in 2006 the number of processors is still rather high compared to countries such as Denmark or the Netherlands, a considerable loss of farmers' market power seems to be evident. The market share of the five largest processors in Germany (Nordmilch, Humana Milchunion, Müller, Hochwald and Campina Germany) totalled up to 33 % in 2005 (Deutsche Milchwirtschaft, 2006).

Due to overcapacities, the dairies are in a highly competitive situation with respect to raw milk procurement. The world market is currently characterised by a strong demand pull. The raw milk market is regionally limited because of product specificities, namely the perishableness. Due to transportation cost considerations, the radius of milk hauling will only seldom be above 200km around the plant. Thus, several dairies are in strong competition for the same suppliers.

On the selling side, dairies have to face a growing concentration in retailing. Retailer procurement is organized nationally and contracts are generally negotiated for one year. The increasing importance of private labels leads to an unfavourable exchangeability of the dairies.

All in all, it can be assumed that the concentration on the processor level leads to an alienation from their suppliers, which in turn decreases their loyalty. In a highly competitive procurement market, this leads to a growing quantity uncertainty which causes problems of delivery reliability towards customers such as retailers. This makes clear, that dairies are in a very challenging situation. In the following section, considerations on future developments of business relationships in the dairy sector are reported.

2.2 Changes in the relationships between farmers and dairies

Traditionally, in the dairy sector, contractual relationships with a duration of at least two years have predominated between farmers or farmer associations on the one hand and dairies on the other. A certain level of contracting seems to be necessary in this sector because of the high frequency of transactions and the related logistic planning.

Nevertheless, this is questioned by dairy farmers who wish to achieve higher prices by building countervailing power, which is not possible under (long-term) contracts. During the last decade, the formerly stable relationship between processors and farmers increasingly came under pressure. Examples of this are the new countervailing power initiatives such as the German Dairy Farmer Association “Bund Deutscher Milchviehhalter” or the Austrian “Interessengemeinschaft Milch”, which act against processors and try to boost farmer prices. All over Europe, such associations call on farmers to cancel their dairy contracts and try to establish new short-term marketing channels for milk. Recent messages about a growing global demand and increasing milk prices add further fuel to the fire. There have already been some ruptures:

The German subsidiary of the Dutch dairy cooperative Campina for example lost 500 out of around 2,100 milk suppliers accounting for 185 m kg of milk (AgraEurope, 2007). Another example is Nordmilch, the largest German milk processor cooperative, who also had to face considerable supplier and shareholder losses. Nordmilch processes about 4 bn kg of milk per year, coming from nearly 10,000 farmer suppliers. It is reported that, in 2006 alone, 1,200 suppliers switched (LZ, 2007).

However, this problem is not limited to Germany. Only recently, the same problem also emerged in the Czech Republic (AgraEurope, 2008). And in Australia, some dairies currently rely on pricing measures such as loyalty premiums in order to bond or attract suppliers (Dairy companies, 2007). Zeuli and Bentancor (2005) analyzed the effect of cooperative competition on member loyalty. They underlined the importance of member retention for dairy cooperatives in Minnesota and Wisconsin due to high overcapacities in processing. Supported by a lack of legally binding supply contracts, this leads to strong incentives to switch dairies in order to bargain for best prices. 27 % of the farmers interviewed in their representative sample switched at least once within a four-year period.

3 Loyalty and commitment: Literature review and development of hypotheses

The above reasoning has shown that supplier loyalty is increasingly important for dairies to stay competitive. In the following section, we will approach the concepts of loyalty and commitment, which are strongly related and sometimes used synonymously. First, some definitions of the concepts are presented. Findings on outcomes and antecedents of commitment and loyalty are then compiled. Finally, as most of the studies deal with customer loyalty, we develop a conceptual framework for supplier commitment and loyalty measurement as a basis for an empirical analysis of relationships between farmers and dairies.

3.1 The concepts of loyalty and commitment

Loyalty and commitment have been discussed by a number of authors in various research fields, such as channel marketing (customer loyalty), consumer behaviour (store and brand loyalty), or organizational behaviour (employee loyalty). As a result, a number of different definitions have evolved (Matanda et al., 2000; Venetis, 1997). This section gives a short overview.

Since loyalty is mostly seen as a behavioural construct, there are suggestions of indicators of loyalty rather than definitions of loyalty. Demonstrations of loyalty as compiled from the literature by Rowley (2005) include staying with the business partner, increasing purchases, or positive word of mouth. Diller (2000) also mentions satisfaction, and positive attitudes towards a supplier.

The opposite of loyalty is relationship ending. In 2002, Täthinen and Halinen provide a literature review demonstrating the growing interest in this topic, especially by the end of the 1990s. Terms used to describe relationship ending are, for example, dissolution, termination, exit, or switching behaviour. The latter expression has also been used in agribusiness research. There are a number of studies analyzing the switching behaviour of cooperative members (for an overview, see Zeuli and Bentancor (2005)). Schulze et al. (2006) measured the willingness to switch of German dairy farmers and pig producers. However, here again this is not defined sharply but introduced as an intentional measure. Fullerton (2003) explicitly measured the concept of loyalty through customers' intention to switch. Generally, it can be stated that loyalty consists of two components, an intentional and a real "action" component. Some authors also add an emotional/affective and a cognitive facet.

Commitment has also been in the focus of many conceptual and empirical works. According to Morgan and Hunt (1994, p. 23), commitment in a business-to-business relationship is present when "an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it". Dwyer et al. (1987, p. 19) defined commitment as "an implicit or explicit pledge of relational continuity between exchange partners."

Commitment is generally considered to be an (attitudinal) antecedent of loyalty (Fullerton, 2003; Hennig-Thurau et al., 2002; de Ruyter et al., 2001; de Wulf and Odekerken-Schröder, 2000; Morgan and Hunt, 1994). Kool (1994, p. 288), for example, distinguished between two types of loyalty dependent on whether commitment exists or not: "True vendor loyalty exists when repeat buying behaviour is accompanied by commitment to the vendor. Spurious vendor loyalty is characterised by consistently selecting one vendor without commitment". This is very close to the work of Dick and Basu (1994), who introduced four states of loyalty, i.e., "loyalty", "latent loyalty", "spurious loyalty", and "no loyalty".

Similar to the loyalty discussion, special dissension in commitment research concerns the question of dimensions or components of commitment (Gundlach et al., 1995). Commitment has mostly been conceptualized as consisting of two or three components. In some cases, attitudinal and behavioural components are distinguished. According to a literature review performed by Gundlach et al. (1995), the attitudinal component of commitment, however, comprises terms such as affective commitment, psychological attachment, identification, affiliation, and value congruence.

Some authors treat the components of commitment as distinct constructs (de Ruyter et al., 2001) and others see them as parts of a one-dimensional scale (del Bosque Rodriguez et al., 2005; Hennig-Thurau et al., 2002; Anderson and Weitz, 1989; Mowday et al., 1982). Fullerton (2003) stated that while affective commitment has a purely positive impact on loyalty, effects of continuance commitment resulting from high switching costs and dependence are ambivalent.

Since for this paper, we only dispose of cross-sectional data, which do not allow observing actual loyalty, the analysis has to be restricted to the concept of commitment.

We base our theoretical framework on the conceptualization of de Ruyter et al (2001), thus model emotional and an intentional commitment as distinct constructs. To resume, it is hypothesized that:

H1: Commitment consists of an emotional and an intentional component. It is hypothesized that these are distinct constructs, with emotional commitment being an antecedent to the intentional commitment.

In the following section, other determinants of loyalty are discussed as well as antecedents of commitment, as they indirectly have an impact on loyalty.

3.2 Antecedents of loyalty and commitment

Despite the acknowledgement of the importance of psychological and social aspects for economic action, it has often been criticized that there is a research gap with respect to the determinants of customers' willingness to bind themselves to a supplier (Diller, 2000; Fournier et al., 1998; Barnes, 1994; Dwyer et al., 1987), especially in B-to-B relationships (Lam et al., 2004). The importance of this question is underlined by Morgan et al. (2000), who state that the fact that a customer or supplier has been loyal in the past, does not necessarily mean that he really feels committed to supplier or buyer, respectively.

In the following, the factors which positively influence loyalty and commitment are discussed. Subsequently, the barriers to commitment, or, as Diller (2000, p. 39) puts it, the "motivators and demotivators" are compiled from the literature. Again, all relevant research streams dealing with loyalty and commitment are consulted.

3.2.1 The relationships between satisfaction, trust, and commitment

In channel literature, satisfaction and trust are commonly agreed to have a strong impact on commitment and loyalty. Similar to consumer marketing, satisfaction reflects comprehensive experience with a business partner and is a necessary but not sufficient condition for an ongoing relationship (van Weele, 2002). In addition to the supplier's own experiences, information from other business partners and other cues build the basis of satisfaction (Homburg and Stock, 2001). According to the disconfirmation model, satisfaction in supplier relationship quality is the result of a comparison between a buyer's performance and the supplier's expectations.

Trust is defined as "a willingness to rely on an exchange partner in whom one has confidence" (Moorman et al., 1992, p. 82). It is combined with the belief that others will not act to exploit one's vulnerabilities (Hansen et al., 2002).

Although satisfaction, trust and commitment are three distinct constructs, there are strong conceptual links between them which have been mentioned by several authors. The following links have been reported in the literature:

Del Bosque Rodriguez et al. (2005) state that most contributions in channel analysis have found that trust has a positive impact on the level of satisfaction with the relationship. However, there are also some studies suggesting the inverse, i.e., satisfaction is conceived as an antecedent of trust in the business partner (Schulze et al., 2006; Batt, 2003; Geyskens et al., 1996; Selnes, 1996; Ganesan, 1994; John and Reve, 1982).

For trust and commitment, we do not find such dissension. Most authors see trust as an antecedent of commitment (Barnes et al., 2005; Kwon and Suh, 2004, 2005; de Ruyter et al., 2001; Andaleeb, 1996; Gundlach et al. 1995; Morgan and Hunt, 1994; Anderson and Narus, 1990). Hansen et al. (2002) found that trust between members of a cooperative and the cooperative management is an important variable to enhance group cohesion.

Depending on how the satisfaction-trust causality is determined, satisfaction is also seen as a direct antecedent of commitment (Hennig-Thurau et al. 2002; Diller, 2000; Ganesan, 1994; Biong, 1993). Mohr and Spekman (1994), finally, see commitment and trust as antecedents of satisfaction, which they use as a measure of partnership success.

An empirical proof of the relationships between them is rather difficult because, with time, each construct can have an impact and feedback on the other. Depending on the duration of

the relationship, trust can also lead to increased satisfaction, or commitment might have an impact on satisfaction. The latter hypothesis has been put forward by Kacmar et al. (1999). Despite the feedback-linkages between the constructs which have been highlighted by the above overview, it is hypothesized that commitment is, in the first instance, affected by the suppliers' trust, which in turn is influenced positively by the satisfaction with the relationship. Satisfaction can be seen as a rather cognitive construct, while trust goes beyond ratio although based on former experiences.

Thus, the following hypotheses are put forward:

H2: Trust has a positive impact on emotional commitment.

H3: Satisfaction has a positive impact on trust.

3.2.2 Factors influencing satisfaction, trust, and commitment

The aim of the paper is to break down the factors influencing farmers' loyalty to a level which dairies can act on. Therefore, due to the strong relationships between commitment, trust and satisfaction, the variables influencing the latter two constructs will also be discussed since they – indirectly – influence the level of commitment between the parties.

Findings about antecedents of satisfaction, trust and commitment are available from research on consumer behaviour, organisational behaviour, channel marketing and agribusiness. Due to their closeness to our research, we will discuss mainly the contributions from channel and agribusiness literature. Following our hypothesis about the satisfaction-trust-commitment-loyalty causality chain, we start with the factors influencing satisfaction, trust and commitment and then proceed to those which directly affect loyalty.

Price satisfaction refers to several relationship studies that state that the economic outcome is important for the evaluation of the relationship (Jaervelin, 2001). In their compilation of factors influencing switching behaviour from diverse empirical studies on relationship ending, Tähtinen and Halinen (2002) also found that pricing plays an important role. Similar results are reported by Schulze et al. (2006) for the German pork and dairy chains as well as Zeuli and Bentancor (2005) from empirical studies which were carried out on switching behaviour of dairy farmers in the US in the 1980s and at the beginning of the 1990s. In all of these studies the importance of price is found to be a reason of switching the buyer.

H4: Price satisfaction has a positive impact on overall satisfaction.

Due to the great importance practitioners attribute to the price in farmers' switching considerations, the hypothesis of a direct impact on loyalty is also tested:

H5: Price satisfaction has a positive direct impact on intentional commitment.

Another factor influencing overall satisfaction is experience with operational sequences which directly affects the supplier or, if offered, with services such as on-farm extension. Concerning the farmer-dairy-relationship, a relevant operational sequence is milk hauling. The route planning and the consideration of farmers' preferences are aspects of this relationship variable. It is hypothesized, that

H6: Satisfaction with operational aspects has a positive impact on overall satisfaction.

and

H7: Satisfaction with on-farm extension has a positive impact on overall satisfaction.

An important factor influencing trust is reliability (Schurr and Ozanne, 1985). Although sometimes used as a measure of trust (Batt, 2003), we state, in line with Barnes et al. (2005) and Selnes (1996), that reliability is an antecedent of trust rather than a component.

H8: Reliability has a positive impact on trust.

Furthermore, credibility of delivered information has been identified as an important influencing factor of trust (Schulze et al., 2006; Selnes, 1996). This is also related to communication quality (Schulze et al., 2006; del Bosque Rodriguez et al., 2005; Matanda and Schroder, 2004; Mohr and Nevin, 1990).

H9: Credibility has a positive impact on trust.

Loyalty research in different contexts has brought forward a discussion about the different motives of loyalty. In this context, the notion of switching costs is important (Rowley, 2005; Young and Denize, 1995). These are the perceived and monetary costs a supplier or buyer has to bear when choosing to deal with another partner in the future (Barnes et al., 2005; Lam et al., 2004; Heide and Weiss, 1995). Reasons for staying loyal in the absence of commitment according to Kool (1994) are habits, a lack of decision making (inertia), perceived absence of choice or a lack of time to evaluate the alternatives. Besides the monetary costs of searching for a new buyer, these aspects increase the perceived switching costs.

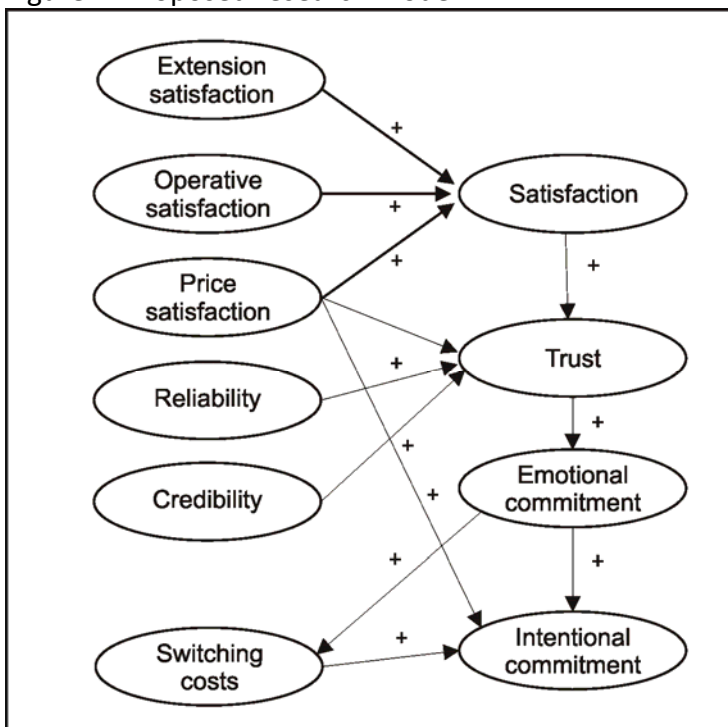
H10: Perceived switching costs have a positive impact on intentional commitment.

Until now, sociodemographics have been left out of the discussion. Zeuli and Bentancor (2005), however, found that farmers with larger herds switch more often. This seems to be plausible since it can be hypothesized that farmers with larger farms have more choice as to their buyers, because they are more interesting for the dairies. It is, therefore, also hypothesized that:

H11: A farmer's loyalty increases with decreasing herd size and productivity, which means higher switching costs.

Figure 1 depicts the relationships suggested in the paper in an overall model. The methodology with which these links are tested is described in the next chapter, before the results are presented.

Figure 1: Proposed research model



4 Methodology

To assess the research model, a survey was conducted among suppliers of a dairy located in Southern Germany in the summer of 2006. In all, 1,740 dairy farmers were contacted. The questionnaires were distributed by the milk collectors. Farmers were provided with a self-addressed prepaid envelope and asked to return the completed questionnaire within three

weeks directly to the research team in order to demonstrate that the replies would remain anonymous. 287 fully completed questionnaires were returned. For the purpose of this paper, farmers who stated they would retire from farming within the next years were excluded from the sample. This resulted in a final sample size of 251 farmers.

For the operationalization of the constructs, seven-point Likert-scales and semantic differentials were applied. Statements are reported in the appendix. A crucial point in the analysis is the measurement of loyalty, because cross-sectional data at one point in time had to be used and there is no information about the past switching behaviour. Thus, this study has to concentrate on intentional commitment.

We conceptualize intentional commitment as the stated disposition to maintain the relationship beyond the current contract. It was measured through two aspects. The first statement concerned the future plans "What about your future plans? Have you already thought about what you are going to do when your current contract expires?" and was operationalized as a seven-point scale.

Another aspect of loyalty is the evaluation of alternatives. The suppliers thus were secondly confronted with a list of seven dairies, including their current buyer and six relevant alternatives in the region. The suppliers were then asked to imagine a situation in which they were able to decide freely to which dairy they wish to deliver their milk and rank the dairies following their preference. Hereby, we explored the perception of alternatives on the one hand and the relative strength of the current buyer compared to these alternatives on the other.

The analysis is divided into several steps. First, the current level of supplier commitment was analyzed. For this purpose, farmers were grouped together based on the two items measuring intentional commitment.

In the next step, the model was checked. First, an explorative factor analysis was performed using SPSS 14.0 to test the constructs. The identified factors then were introduced into a structural equation model to check the hypotheses delineated above. This method is appropriate whenever complex models with various interdependences are conceptualized. The calculations were carried out with AMOS 5.0.

5 Results

5.1 Current level of supplier loyalty

A cross tabulation provides the basis of the segmentation. The different shadings in Table 1 show how the groups were constituted from the two loyalty statements based on plausibility considerations. Suppliers who stated that they would remain loyal to their dairy whatever happens or could not imagine switching were classified as loyal (white), if they also ranked their buyer first. The extreme opposite is formed by those who are already sure that they will not continue their contract, and those who did not rank their dairy first and stated that they could easily imagine switching the dairy. This group obviously is disloyal (shaded dark grey).

Table 1: Cross tabulation: loyalty of dairy farmers

		„What about your future planning? Have you thought about switching your dairy?“						
Ranking		I stay loyal to my dairy whatever happens.	I cannot imagine switching my dairy.	I can rather not imagine switching my dairy.	I have not thought about switching yet.	Switching my dairy would perhaps be a possibility for me.	I could easily imagine switching my dairy.	I will not continue my contract with my dairy.
Rank 1		29	16	27	53	20	5	2
Not rank 1		0	2	7	10	40	37	3

Absolute numbers of respondents

The distribution of the sample over the supplier categories is almost equal except for the huge group of passive loyal suppliers. More than one third of the sample is found to display clear or critical disloyalty, and another 14.4 % show signs of latent disloyalty. 32.7 % can be called passive, since they do not state a clear position towards staying loyal. With respect to the above-mentioned categorization of Kool (1994), the passive loyal and latent disloyal are quite similar: Both state a slight lack of alternatives as well as a rather low disposition to search for new buyers. Finally, only 17.9 % of the dairies' supply base is not threatened. Thus, the basic assumption of high disloyalty in the dairy sector is confirmed.

The mean comparisons shown in Table 2 reveal some linkages between the sociodemographic variables, farm characteristics and supplier loyalty; i.e., farmers with a greater milk production (kg of quota) and higher production efficiency as well as younger farmers have a stronger tendency to switch. Obviously, these farmers are important (A-) suppliers. However, the relationship is not strong enough to use size or productivity as the

only segmentation criteria to distinguish loyal and disloyal farmers. Hypothesis H11 thus can only be partially accepted.

Table 2: Characteristics of loyal and disloyal suppliers

	Total	Loyal n=45 17.9 % of suppliers	Passive loyal n=82 32.7 %	Latent disloyal n=37 14.4 %	Critical intention of disloyalty n=45 17.9 %	Disloyal n=42 16.7 %	f-statistic (p-value)
Ø farmland [ha]	45.5 42.4	37.7 32.2	53.5 53.7	40.2 36.2	42.3 38.5	47.2 35.8	1.296 (.272)
Ø milk production per year [kg]	199,418 141,448	138,206 93,333	199,507 161,568	220,114 135,001	187,477 115,431	260,780 149,524	4.556 (.001)
Ø milk yield [kg]	6,592 1,184	6,129 1,067	6,465 1,258	6,751 1,174	6,577 1,158	7,202 948	5.073 (.001)
Ø age of farmer [years]	45.4 10.0	49.1 11.0	45.4 9.4	45.1 8.0	45.5 11.8	41.1 7.6	3.662 (.006)
Ø share of milk production in farm income [%]	68.1 21.3	64.0 21.8	64.4 22.2	76.1 22.3	70.2 20.1	73.1 16.5	2.910 (.022)

Upper values are means; lower values are standard deviations.

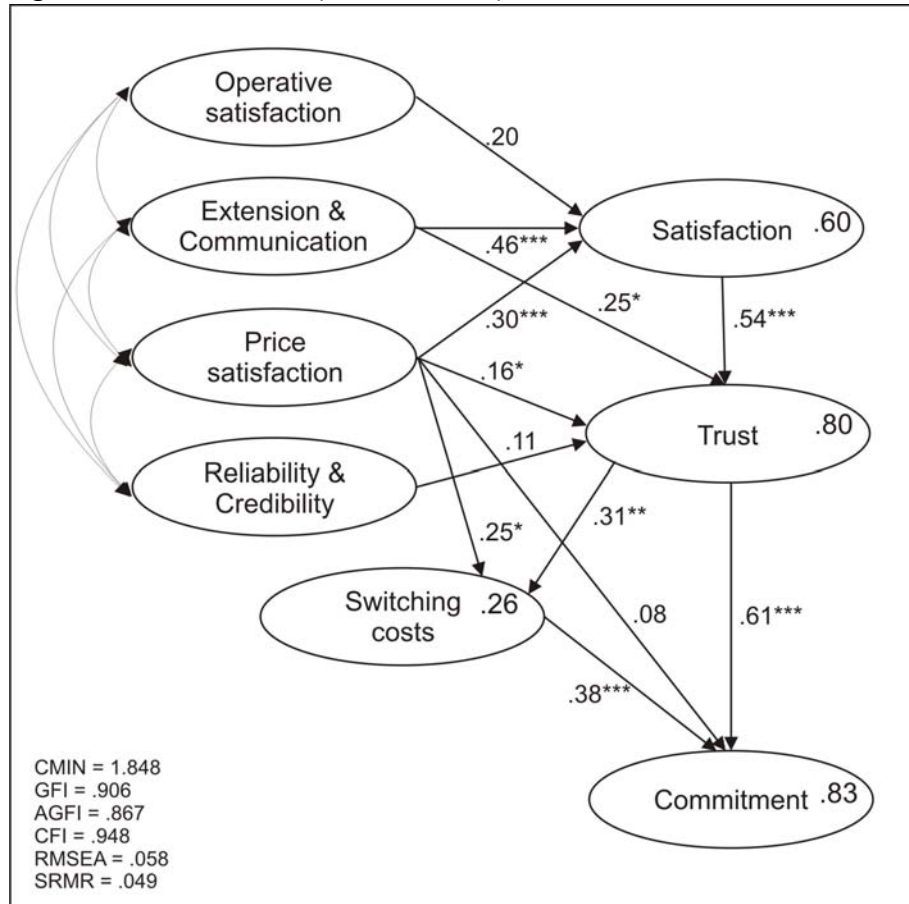
5.2 Loyalty of dairy farmers – Structural equation model

A preliminary principal component factor analysis provided first evidence about the appropriateness of the proposed constructs. The first important result is that intentional and emotional commitment cannot be treated as distinct constructs. Thus, H1 has to be rejected. Furthermore, reliability and credibility as well as extension satisfaction and communication respectively build one factor.

The other factors were confirmed as proposed and included into the structural equation analysis. The statements subsumed under the factors are reported in the appendix. In a whole, the model comprises four endogenous and four exogenous variables.

The global goodness-of-fit statistics show that the model fits the data quite well (Millsap, 2007, Streiner, 2006, Byrne, 2001, Mulaik et al., 1989): The Goodness-of-Fit Index (GFI) is .906, the Adjusted Goodness-of-Fit Index (AGFI) is .867, the Comparative Fit Index (CFI) is .948, the Root-Mean-Square Error of Approximation (RMSEA) is .058, and the Standardized Root Mean Square Residual (SRMR) is .049. All in all, these values indicate quite a good model fit. In Figure 2 the standardized path coefficients of the structural model are shown.

Figure 2: Model results (direct effects)



The causal linkages between trust and commitment (H2), and satisfaction and trust respectively (H3) are confirmed. Following verification of the important roles of satisfaction and trust for commitment, in the next steps, the factors affecting these constructs are described.

As hypothesized, price satisfaction and extension satisfaction have a positive impact on overall satisfaction (H4 and H7 accepted). The impact of operative satisfaction is not significant (H6 rejected). The three factors together explain 60 % of the variance in farmers' satisfaction, with extension satisfaction having the highest impact.

Finally, price satisfaction has no significant direct impact on commitment; H5 thus has to be rejected.

The path coefficient of the reliability and credibility factor is low and only significant at the 10 %-level; H8 and H9 nevertheless are confirmed.

Perceived switching costs have been measured by three items, including the perceived number of good alternatives, the perceived difficulty of finding a new buyer, and the extent

of readiness to search for a new buyer. In accordance with H10, switching costs are not to neglect in the analysis of farmers' loyalty.

The examination of covariances in the dataset showed that there are relationships between switching costs and price satisfaction and trust respectively. The two constructs together explain about 26 % of perceived switching costs. This low explanatory power can be explained by the important effect of regional dairy density, which has not been modelled explicitly.

Table 3: Standardized indirect and total effects

	Commitment	Trust	Satisfaction	Switching Costs
Explained variance (R ²)	.83	.80	.60	.26
Trust	.12/.73			-.31
Satisfaction	.39/.39	-.54		.17/.17
Price Satisfaction	.33/.41	.16/.32	-.30	.10/.35
Extension & Communication	.36/.36	.25/.50	-.47	.16/.16
Operative Satisfaction	.08/.08	.11/.11	-.20	.03/.03
Reliability and Credibility	.08/.08	-.11		.03/.03
Switching Costs				-.38

Numbers in front of the slash represent indirect effects; numbers behind the slash represent total effects.

6 Discussion of theoretical and managerial implications

The analysis shows that emotional and intentional commitment cannot be distinguished into separate constructs. Satisfaction and trust are confirmed to be important antecedents of commitment. Taking into account total effects, satisfaction however stands behind price satisfaction, which also has direct impacts on trust and commitment. Extension and communication as well as switching costs also have a strong total effect on commitment.

Overall satisfaction is affected very strongly by farmers' satisfaction with on-farm extension, while operative aspects such as milk hauling processes do not play a very important role.

From a management perspective, the great importance of trust highlights the necessity of rethinking the role of prices within the enterprises communication strategies. Investments in trust-building activities can pay back for enterprises since trusting suppliers are likely to bear short-time sacrifices in prices. This is also supported by the direct impact of trust on perceived switching costs, which is even higher than the effect of price satisfaction.

The impact of reliability and credibility on trust is much lower than the impact of satisfaction. This is quite astonishing, since in many studies, these aspects are used as indicators of trust when no direct measurement is applied. Since credibility means the

absence of opportunistic behaviour, the perceived danger of fraud is probably smaller within the dairy industry compared to sectors such as slaughtering, where a strong impact of this construct was found by Schulze et al. (2006). In milk production, there are fewer opportunities to influence the measured milk quality and quality parameters of milk stay the same for long periods, while manipulations of carcass classification processes and fast changing price schemes have very often been reported from the meat sector.

7 Limitations

Supplier commitment is a rarely discussed topic, scientifically and in practice alike. With this study, we contribute to bridge this gap and try to shed light on the development of commitment and its different forms. However, only cross-sectional data are analyzed, thus the measurement of the actual loyalty is not possible, and the dynamic interactions of the most important relational constructs, satisfaction, trust and commitment cannot be identified either.

It might, furthermore, be interesting to analyze the farmer's general propensity to be a loyal supplier (price relevance, herd size, etc.), irrespective of the current relationship. This discussion is very close to entrepreneurship research but also deeply anchored in personality psychology (Bergevoet, 2005).

Finally, it has to be mentioned that the differentiation between loyalty and intentional commitment is difficult, but promising. Further research has to be conducted in this respect. However, longitudinal data are necessary in order to operationalize the construct of loyalty appropriately and make statements on this relationship.

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Appendix

Table 4: Constructs

Constructs	Items	SMC	Cronbach's alpha
Commitment	I feel committed to this dairy.	.557	.850
	I am proud of being a supplier of this dairy.	.719	
	What about your future planning? Have you thought about switching the dairy?	.472	
	I would recommend to other farmers to become suppliers of this dairy.	.615	
Trust	I can trust in this dairy.	.666	.814
	From long-term experience I know that I can trust in this dairy.	.708	
Satisfaction	All in all, I am (strongly satisfied – strongly dissatisfied) with the collaboration with this dairy.	.605	.821
	Overall the collaboration with this dairy works well.	.769	
Price satisfaction	In comparison to other processors this dairy always paid a good milk price in the past.	.618	.803
	In comparison to other processors I am (strongly satisfied – strongly dissatisfied) with the price paid by this dairy.	.705	
Operative satisfaction	If there are changes in the milk hauling process, this dairy considers our interests.	.527	.586
	I am (strongly satisfied – strongly dissatisfied) with the milk hauling processes.	.339	
Extension & communication	This dairy informs me badly.*	.526	.725
	I feel well-advised by this dairy's consultants.	.555	
Reliability and credibility	It often happens that agreements are broken by this dairy.*	.587	.861
	This dairy is not credible.*	.938	
Switching costs	I would not be keen on searching more often for a new buyer.	.347	.663
	There are enough other dairies to which I could deliver my milk.*	.379	
	Today, finding a good buyer is very difficult.	.479	

* recoded; SMC = Squared Multiple Correlations

Table 5: Regression Weights

Parameter	Estimate		Std Error	t-stat	p
	unsta- dardized	standar- dized			
Trust – commitment	.532	.608	.072	7.351	.000
Switching costs – commitment	.413	.383	.088	4.673	.000
Price satisfaction – commitment	.067	.084	.057	1.176	.240
Satisfaction – trust	.700	.536	.134	5.222	.000
Reliability and credibility – trust	.086	.106	.057	1.527	.127
Price satisfaction – trust	.142	.157	.064	2.237	.025
Extension & communication – trust	.314	.248	.143	2.196	.028
Operative satisfaction – satisfaction	.203	.199	.109	1.859	.063
Extension & communication – satisfaction	.449	.465	.099	4.550	.000
Price satisfaction – satisfaction	.204	.295	.056	3.659	.000
Trust – switching costs	.254	.314	.089	2.840	.005
Price satisfaction – switching costs	.182	.249	.083	2.202	.028