



## Food quality management system: Reviewing assessment strategies and a feasibility study for European food small and medium-sized enterprises

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### ABSTRACT

Literature indicates a need for a user-friendly food quality management system (FQMS) customized to the requirements of food small and medium-sized enterprises (SMEs) for improving product and process quality and enhancing customer satisfaction. Application of quality management system within discreet and process industries is evident. However, there are limited studies that focused on the implementation of a quality management system (QMS) among SMEs operating in the food sector. This study explains the results of a feasibility study on FQMS among European Food SMEs. The objective of this study is to diagnose the status of the FQMS, and to find out what motivates and hinders the successful implementation of FQMS in SMEs. The findings show that none of the food SMEs involved in this study implements FQMS in its true form. The size of the company is a significant factor with respect to quality management implementation, as medium-sized companies were more mature in FQMS implementation compared to their small and micro counterparts. The confectionery, chocolate and meat sectors are more advanced than bakery, packaged fruits and vegetables sectors, with respect to the implementation of quality management tools and techniques. The study revealed that the most important benefits of a quality management system were reduction in cost of production and increased productivity. The key barrier to implementation of FQMS was “lack of knowledge and training” among food SMEs.

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### 1. Introduction

The importance of quality has significantly grown in the food sector over the last decades because of increasing consumers' expectations, governmental regulations and expanding competition in the market. In response, food companies have increasingly pursued quality management (QM) practices in recent years. ISO 8401 defined QM as “[all activities of the overall management function that determine the quality policy, objectives and responsibilities, and implement them by means such as quality planning, quality control, quality assurance and quality improvement within the quality system” (ISO 8402, p. 1)].

This study uses the definition provided by [Luning, Marcelis, and Jongen \(2002\)](#) stating that quality management system comprises “the activities and decisions performed in an organization to

produce and maintain a product with the desired quality level against minimal costs. Both the aforementioned definitions clearly indicate that QM is the responsibility of everybody in the organization—not just the quality department. Empirical studies have illustrated that QM practices can have several favorable impacts on operational variables such as productivity, quality, delivery, and customer as well as employee satisfaction ([Kumar & Antony, 2008](#)).

Literature indicates that the implementation of QM depends on organizational factors such as the size of the organization, the type of suppliers and customers, the degree of automation, the type of products, quality assurance requirements and importantly the top management's commitment ([Trienekens & Zuurbier, 2008](#)). The challenges in establishing an appropriate QM system are more intense for the SMEs due to a lack of resources, competencies and diseconomies of scale ([Antony, Kumar, & Madu, 2005](#)). In addition, there are significant differences between SMEs and large manufacturers with respect to structure, policy making procedures, resource utilizations, staff patterns, culture and patronage ([Welsh & White, 1981](#)). The implications and sustainability of QM practices in

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an SME environment is still a debated topic in the field of operations management research (Thomas & Barton, 2006). Most of the studies focus on either large organizations or SMEs within the non-food sectors (Hulebak & Schlosser, 2002). Further, there is limited literature on the status, benefits and barriers of QM practices in SMEs operating in the food sector (Gellynck, Dora, Kumar, & Molnar, 2010). The reason may be attributed to the complexity of the food production chain and the resource constraints of SMEs. It is evident that food and its production process have special characteristics such as a short shelf-life, heterogeneous raw materials, seasonality, and varied harvesting conditions. These factors hugely affect storage, conditioning, processing, packaging and quality control which make a QM initiative more complicated. Table 1 illustrates the differences between the food sector and other manufacturing industries that are involved in batch and in mass productions (Cuevas, 2004; Hartmann & Wandel, 1999).

This study focuses on food SMEs in Europe due to two reasons. First, the food industry is the largest manufacturing sector in the European Union, with a turnover of €965 billion which generated 4.4 million direct employments and served over 500 million consumers in 2008. More than 90% of the food and beverage companies in Europe are SMEs, accounting for 63% of the employment in that sector (CIAA, 2010). Second, according to a European Commission communication, the European food sector lacks competitiveness in comparison to North America and Australia. The uncompetitive and inefficient food sector has negatively impacted the EU economy in recent years (Commission, 2008). Under these circumstances it is imperative for the food SMEs and policy makers to examine the existing practices, as the competitiveness of a company depends on the cost, quality, delivery, and dependability of the company. Hence, this feasibility study aims to provide a diagnosis of existing QM practices among European food SMEs, which can help companies and policy makers to improve the competitiveness. The objectives of this study can be summarized as follows:

1. To analyze the managers' perceptions of the status of the QM practices among European food SMEs
2. To identify benefits from the implementation and practice of QM principles
3. To identify barriers to the implementation of QM among food SMEs in Europe

After a thorough literature review this study opted for the Food Quality Management (FQM) framework proposed by Luning et al. (2002). There is no dearth of literature on "quality management system". However, there is only a limited corpus of literature on "quality management system specifically addressing the needs of the food sector". Table 2 shows the list of relevant studies focusing on quality management in SMEs. The table is comprised of two sections – quality management in the non-food sector, and food sector. It reveals an interesting pattern among the food and non-

**Table 2**  
Quality management in non-food and food sector.

Author (year)	Methodology (Sample size)	Sector	Focus/approach	Country
Gotzamani and Tsiotras (2001)	Survey (84)	Non-food	ISO, TQM	Greece
Pinho (2008)	Survey (80)	Non-food	TQM	Portugal
Psomas, Fotopoulos, and Kafetzopoulos (2010)	Survey (93)	Service	ISO	Greece
Wilkes and Dale (1998)	Case study (7)	Non-food	EFQM	UK
Hansson and Klefsjö (2003)	Case study (9)	Non-food	TQM	Sweden
Mackau (2003)	Case study (1)	Non-food	ISO	Germany
Thomas and Webb (2003)	Survey (500)	Non-food	ISO 9000, EFQM	UK
McAdam (2000)	Case study (20)	Non-food	BS, BEM	UK
Gunasekaran, Forker, and Kobu (2000)	Case study (1)	Automotive	JIT/Kanban	UK
Khan, Bali, and Wickramasinghe (2007)	Survey (150) Interviews (20)	Non-food	BPI, TQM, Lean sigma	UK
Chileshe (2004)	Survey (63)	Non-food	TQM	UK
Ahmed, Hassan, and Taha (2004)	Survey (63)	Non-food	TPM/TQM	Malaysia
Kumar and Antony (2008)	Survey (64)	Non-food and food (7)	TQM, Lean, Six Sigma	UK
Burlingame and Pineiro (2007)	Literature	Food	Food safety	General
Manning and Baines (2004)	Literature	Food	HACCP	General
Campbell-Platt (1994)	Editorial	Food	Safety, HACCP	General
Caswell, Bredahl, and Hooker (1998)	Meta-analysis	Food	HACCP, ISO	General
Westgren (1999)	Case study	Food	HACCP	France
Aggelogiannopoulos, Drosinos, and Athanasopoulos (2007)	Case study (1)	Food	ISO	Greece
Trienekens and Zuurbier (2008)	Literature	Food	ISO, HACCP	Europe
Holt and Henson (2000)	Case study (9)	Food	TQM, HACCP	UK
Scott, Wilcock, and Kanetkar (2009)	Survey (46)	Food	Lean, Six sigma, TQM, HACCP	Canada
Cox and Chicksand (2005)	Case study (7)	Food	Lean	UK
Mensah and Julien (2011)	Case study (3)	Food	ISO, IFS, BRC	UK
Karipidis, Athanassiadis, Aggelopoulos, and Giompliakis (2009)	Literature	Food	HACCP, ISO	General
Mann, Adebajo, and Kehoe (1999)	Survey (50)	Food	EFQM	UK

**Table 1**  
Differences between manufacturing industries and the food sector.

Manufacturing industry	Food sector
Generally non-perishable products	Highly perishable products
Mostly semi/automatic production line	Manual or very little automatic operation
Standardized raw materials	Variation in quality of raw materials
Large batches of products/components/ fixtures made of materials of relatively uniform quality	High variation of composition, recipes, products and processing techniques
Relatively limited number of designs	Lower volume of batches

food sector with respect to the focus/approach of quality management.

The summary of the table is as follows:

1. Almost all studies in the non-food SMEs category are focusing on TQM, Lean, Six sigma. There are few studies in the non-food category focusing on ISO, EFQM.
2. The majority of the studies in the food SMEs category are focusing on quality assurance (HACCP, BRC, ISO). The primary objective of these studies are food safety which is just one part of the broad quality management system. There is a limited

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