INTEGRATED QUALITY MANAGEMENT IN MEATPRODUCTION

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SUMMARY

A suitable definition of quality for human foodstuffs is 'meeting the expectations of the consumer'. Often consumers are prepared to pay more for products which are perceived as qualitative. In this sense quality means value adding. Quality is dealing with both product-quality and processquality. Quality management involves all activities and decisions aimed to determine the quality level, to effectuate and to maintain it, as all necessary means and methods. Within quality-management operational, strategic and management infrastructure decisions can be distinguished. The performance of an organization depends on the interrelation between its environment, its policy and its management. In agriculture quality of products is determined by the processes throughout the entire foodchain, which is demanding for an integrated approach. The same managementconcepts to manage an organization can be used to manage a chain. However, its performance will depend on the willingness of parties to cooperate, the acceptance of the level of cooperation, expected results, qualitycontrolcosts, etc.. The main challenges the meatproducing line of business has to meet are a reorganization towards a market-, quality- and sustainable directed meatproduction; putting emphasis on profit maximization. An integrated quality management approach might contribute to it.

INTRODUCTION

Consumers do have a preference and are demanding for quality, with regard to convenience, animal welfare, diversity, health, etc.. On the other hand are meatprocessors more interested in quality in order to gain competitive advantage. To improve quality is not just meeting the productspecifications, but also the improvement of processess. This means a managerial approach of quality. For this purpose a managementmodel will be introduced. Also will be argued that optimizing quality demands an integrated approach in meatproduction. Finally it will be discussed that meatproduction can only become successful by an integrated approach and a reconsideration of its policy.

QUALITY MANAGEMENT

The concept quality

The concept 'quality' has several meanings. Often it is translated as 'meeting the needs of specification' or as stated by Juran (1988) 'Quality is fitness for use'. A more proper definition of quality and more suitable for human foodstuffs is: 'quality is meeting the expectations of the consumer' (Van den Berg 1993, p22), because the consumer of human foodstuffs is taking more aspects into account then only those which are part of fitness for use. Cramwinckel cited by Van den Berg (1993, p23) distinguishes analytical and emotional quality.

Analytical quality consists of production traits which contribute to the quality of the product. The appreciation of a product by its consumer is the so called emotional quality. Both are not completely the same. There are productdifferences which can not be noticed by consumers, on the other hand consumers recognize productdifferences which can not be analyzed.

Quality costs

Often consumers are prepared to pay more for products which are perceived as qualitative. In this sense quality means value adding. The foundation of the price of a product are its costs. Minimizing costs is very often an objective of producers. This means avoiding costs of products which can not meet the qualitystandards, but also producing efficient and effective. To pay attention to qualitycosts is meaningful because they have a considerable share in the total costs and can be reduced easily by a directed policy. On the other hand they are connected to the continuity of the firm. If the quality image is poor high costs have to be made to remain competitive (Dale and Plunkett, 1991). In general there are two concepts to deal with quality costs. The PCF and TQM concept, both will be elaborated.

The Prevention, Controlling and Failure (PCF) concept: The costs according to this concept are connected to the product and its specifications. One can distinguish preventive, controlling and failure costs. Preventive costs enclose all costs which occur during processing and are aimed to prevent qualitydeviations. Controlling costs are costs which are aimed to determine unwanted qualitydeviations. Finally, failure costs. These are costs which have to be made to correct qualitydeviations. There are several ways to split up these costs, f.e. supplier-company-customer, controllable-uncontrollable or direct-indirect (Dale and Plunkett, 1991).

Within the PCF-concept there are generally two opinions about the relation among the various qualitycosts. According to Juran et al. (1978) prevention costs will first increase gradually with the level of quality. After a certain level prevention costs have to increase much more to obtain a higher quality level. Controlling costs can decrease if a high quality level is obtained. If many preventive measures are carried through the chance of quality deviations will reduce. Controlling and failure costs will decrease. At a certain optimal quality level quality costs will have their minimum. According to Juran (1986) implies perfect quality (zero-defects) tremendous high preventive and controlling costs, which is not economical. This opinion is criticized by those who are in favour of the zero-defects approach (Schneidermann, 1986; Caplan, 1986;, Crosby, 1992). In their opinion control and prevention found on an economical base will lead to zero defects.

In advanced mechanized processing industries, f.e. carindustry, extreme low failure scores seem to be attainable. However, in agriculture zero-defects are not a real option because of the nature of the product (De Heer et al., 1988).

Total quality management: Total quality management is focusing on the continuous improvement of quality of both the product and its processes contrary to the PCF-concept. But it is also directed towards costreduction (Imai 1990, Clerx 1993). The fact that products meet productspecifications does not mean that all productprocesses are efficient. Next to prevention and controlcosts, processing costs are distinguished. Clerx (1993) determines these costs by analyzing the processes and qualifies bottlenecks and dissipation. To increase the total qualitylevel will contribute to a higher return on investment, by less costs and more value addition (Blauw 1991). According to Logothesis (1991) is a reduction of qualitycosts not an objective on itself but a natural consequence.

Quality management

Quality is dealing with both productquality and processquality in order to add value, to avoid 'no-quality' products and to produce effective and efficient. A policy emphasizing on both might be successful. This can be demonstrated by Clifford and Cavanagh (1985) and Ziggers (1993). Clifford and Cavanagh concluded in their research among 525 midsize businesses that almost all of the winning businesses compete on the base ofvalue and not on price. They were superior in quality compared to the average. In a research of Ziggers (1993) among 39 potplantnurseries it turned out that an improvement of the level of management (which means a more structured planning and productioncontrol) by 1% led to an improvement of return of investment by 0.26%.

Quality management involves all activities and decisions aimed to determine the quality level, to effectuate and to maintain it, as all necessary means and methods (Van der Bij et al., 1988). Management itself is conceived as initiating, directing and controlling goalsetting activities, which involves decision-making (Kampfraath and Marcelis, 1981:p20). Quality management is focusing on productquality by controlling three important processes:

1) purchasing,
2) processing,
3) sales.

Decisions about these three processes are considered as operational management decisions. They are aimed to produce products with a certain quality performance, against certain costs and a certain supplying reliability. Decision-problems to deal with are for example: the acceptance of raw materials, the composition of a productionprogramme, the audit of work in progress, etc..

The productquality itself is a balance between quality, quantity and costs and depends on the objective of the organization (Van der Berg, 1993, p202). To obtain the objective resources should be attuned to it. This means that objectives should be described in terms of marketshare, productionlevels, qualitylevels, research and development, etc.. Next, resources, including people, capital, raw materials, processing equipment, etc., have to be given form into number of vacancies, investmentbudgets, marketingbudgets, purchase contracts, etc.. Decision problems to deal with are for example: the weigh up of objectives and resources, the evaluation of available resources, etc.. These decisions are considered as strategic managementdecisions.

These decisions are made by an organization. The organization itself can be described in terms of people, information, knowledge, organizational arrangements and management means (management conditions). A so called management infrastructure, which determines the performance of the organization. The organization itself has also to be managed. This means a provision with management conditions in order to proceed strategic and operational management properly. These decisions will affect the performance of the organization. In other words: 'organizing the organization'.

The completeness of the decisionmaking process can be evaluated by reviewing it on:

1. *systematics*, are similar decisionmaking problems solved in a similar way?,

2. *feedforward*, are effects of a decision taken into account during the time period covered by that decision?,
3. *feedback*, are previous related decisions evaluated?,
4. *integration*, has the decision problem been placed in a broader context?

The effectiveness of an organization is the outcome of a certain organizational environment, its policy and its management. It can only be affected by either changing the policy or the management or both. This is shown by figure 1 . The organization described in terms of people, information, organizational arrangements and management means, is a rather formal one. One should be aware that the actual performance is also affected by the behaviour of people and their interrelations. The so called informal organization. These relations depend on power, values, attitudes, etc., and might have a considerable effect.

Often several special areas of interest are distinguished, like quality, processing, environment, financing, marketing, logistics, research and development, etc.. These areas have in common that they are all linked up with the product somehow and are interrelated. Quality as a special area of interest is just a part of the total management. Therefore quality will be conceived as 'the performance of the organization', which links on to theTQM-concept. The essence of this model is to adjust the organization to production not to adjust production to the organization. Therefore the starting point of an analysis should be the product and its processingstages, not the organization.

Towards an integrated quality management

The quality of agricultural products is determined by the processes throughout the entire food chain. This because of the nature of the products. The importance of an integrated approach can be shown by research of the VVDO/KH-team (1988) and research of Den Hartog et al. (1990). The quality and hygiene project in the meatprocessing line of business (VVDO/KH-team, 1988) indicated that 85% of the meatprocessing firms were only able to fulfil up to 40% of the conditions of NEN-standard 2646. Quality management was reduced to control and inspections. Suppliers were only selected on price, deliverytime and familiarity, instead of quality of livestock. At the farmlevel quality care is also of great importance. Research of Den Hartog et al. (1990) indicated less slaughter abnormalities due to housekeeping conditions. Also the feedback of information of the processingstage to the fattening stage reduced the percentage of slaughter abnormalities.

These results do indicate an interdependency among activities within the several processing stages of the meatchain. This implies that optimizing quality management in a certain processing stage of the chain might be set aside if quality management is poor in other processing stages. This stresses the importance of an integrated quality management. It will be easier to obtain integrated quality management if one is aware of the intended results in terms of quality specifications, costs, deliverytime and -reliability and the intended productionprocess within the chain in terms of time, capacity and processes.

Integrated quality management is mend to control the processes throughout the entire chain. This is much more complex in a network then in a separate organization, because one has to deal with several independent firms with their own objectives and interests. Especially in the meatproducing line of business it is quite complex, because a processing firm has many suppliers. Again costs will be involved.

These costs can be considered as integrated quality costs. Zuurbier (1992), distinguishes:

1. coordination costs with regard to the exchange of information, the adjustment of productionprocesses, etc,
2. compromising costs which have to be made to give priority to joint activities instead of individual activities,
3. resignation costs when firms retreat from joint activities bringing losses upon other firms.

The effectiveness of a chain is to some extend similar to the effectiveness of an organization. It is the outcome of the interrelation between chain environment, policy and management. This idea is supported by Godfroij (1981, p105-115) saying that organizations and networks of cooperating organizations show only gradual differences along the dimensions that measure the degree of organization and therefore can be analyzed with the same concepts and theories as organizations.

The performance of a chain depends on how processes and resources are attuned within it. From a managerial point of view the processes of purchasing, processing and sales should be attuned in order to meet the productspecifications in terms of quality, quantity and costs. That is also why chain objectives and resources have to be attuned. The actual performance of both a firm and chain will be determined by the existence of a certain management infrastructure. The management of purchasing, processing and sales is considered as operational management, while the management of resources is considered as strategic management. The management of the management infrastructure is considered as organizing the chain, which will lead to the provision with management conditions. The effectiveness of a chain will depend on the interrelation among its environment, its policy and its management. This is similar to the management of an organization and is shown in figure 2 (Ziggers, 1994).

Similar to an organization one can distinguish a formal and an informal chainorganization. The performance of it will depend on its rigidity and behaviour of chain participants. One can think of the presence of routine structures impeding organizational learning; opportunistic behaviour, bounded rationality, power, appropriability, etc. of participants (Groenewegen, 1989; Ziggers, 1994).

According to the structure of this line of business it is not real to assume that a chain can be managed in a central way. However, the provision with the proper management conditions might strengthen the relations within it. The Integrated Quality Control (IQC) project of the Productboard for Livestock and Meat (PLM) (1992) has shown that the provision of information contributes to improve quality. It requires an adequate managementinfrastructure, exchange of information (f.e. Electronic-Data-Interchange (EDI)), procedures and organizational structures to adjust activities within the chain. Several patterns of cooperation can develop.

An example to elaborate this. Some parties representing several processingstages of the porkproducing line of business decide to produce trademark meatproducts. They agree upon the following policy:

1. the policy of every individual party will be in accordance with the joint agreements concerning the productspecifications,

2. quality control of purchasing, processing, sales and resources will be attuned to effectuate the productspecifications,
3. Management conditions are attuned to effectuate the productspecifications and quality control.

With regard to the third aspect, parties have the possibility to choose the aspired level of chaincontrol. A low chaincontrol can be considered as: exchange of plain information with regard to quality, plain consultingprocedures with regard to productdiviations and a limited exchange of knowledge which is necessary to control quality. A high chaincontrol is considered as the on-line exchange of information among parties with regard to some product- and processing parameters found on standardized procedures, formal meetings to discuss quality control, to appoint a central network qualitymanager to coordinate quality activities and a structured exchange of knowledge to improve and control quality performance. Many other forms of chaincontrol are likely. Which level of control is desired will also depend on the willingness of parties to cooperate, the acceptance of the level of cooperation, expected results, qualitycontrolcosts, etc..

DISCUSSION

Integrated quality management catches on in the meatprocessing line of business, because of stagnating markets and through that gaining competitive advantage. Examples are IQC introduced by the PLM, the implementation of ISO-NEN 9001, the development of trademark meatproducts, etc.. These activities make only sense if the integrated quality management concept is carried through the entire chain (Strecker et al., 1989, p 183). According to Zuurbier (1992) are many of these activities going beyond the actual necessity to improve quality in order to remain competitive compared to other EC-competitors.

Integrated quality management in a narrow sense aimed to improve meatquality alone is indeed not enough. The effectiveness of a chain will besides its management also depend on the interaction with its environment and policy. Nowadays market is a buyersmarket, which means a need for a market directed policy instead of product directed policy. Activities as ISO-NEN 9001, IQC and trademark meat, can only succeed if also the financial means are available to carry through a marketing policy, a costpolicy will be turned into a value adding policy and participants commit upon joint activities (Strecker et al., 1989, p 183). So far many activities and promotions have been emphasizing on the promotion of meat. Instead of promoting the meat as a trademark itself it is often promoted as a national product. This makes it very susceptible to incidents or outbreaks of contagious diseases. As a consequence the entire production will be affected.

The main challenges the meat producing line of business has to meet, are:

1. a reorganization towards a market-, quality- and sustainable directed meatproduction,
2. putting emphasis on profit maximization by means of productdifferentiation, maximization of value and minimization of costs.

Meatproducing chains do have several strategic options. They can decide in favour of a niche market, marketleader- or costleader strategy. For the present the strategy of being a costleader seems to be

the most reasonable, because Dutch meatproduction has been able to build up a very efficient highly skilled production. To prolong competitiveness more attention should be payed on a market directed production offering quality. The strategy of niche-markets seems to be attractive for smaller meatproducing chains. It is likely that only a small percentage of meat can be disposed in special segments. To be a marketleader demands a high maketshare. This is not the case at this moment for any of the meatproducing chains. To increase marketshare (international) mergers, take-overs, etc. are necessary which is capital demanding. Nevertheless, under the circumstances meat producing chains have to reconsider their positions and due to globalization production is no longer restricted to national borders. It implies that the meatproducing line of business will become more divers.

An integrated quality management approach in a broad sense might contribute to restructure meatproducing chains towards a competitive market directed line of business. Methods like Hazard Analysis Critical Control Point (HACCP) and Good Manufacturing Practice (GMP)-codes can contribute to assure quality of meat. Besides, one should avoid the creation of a bureaucratic system. First the productspecifications and its critical points should be determined, then an assurance system can be developed which meets these critical points. This should also be the base of certification or trademark meat. Nevertheless quality is:' meeting the expectations of the consumer' and is propagated by the entire chain.

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