

A closed-chain concept for application in the floristry sector

S.D.C. Deneux, MSc

J.H. Luten

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The floristry market is becoming more and more customer oriented. Therefore, product innovation, tracking and tracing, and product guarantee become important factors of success when looking at the future of the flower market. Several structural concepts allow the fulfilment of these requirements. The so-called closed chain concept enables products to be identifiable and recognisable at every stage of the chain process, as demonstrated in several agricultural sectors.

The relevant questions here are how feasible the application of such a model is to the Dutch floristry sector and how this can be implemented.

Orders:

Phone: 31.70.3358330
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Phone: 31.70.3358330
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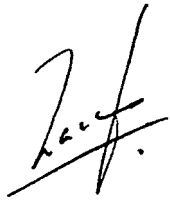
Foreword

The consumer of the 21st century asks for guarantees when it comes to tracing origin and process of products. Chain structure and distribution systems must be reconsidered in order to make such requirements possible. The Dutch floristry sector must be prepared to fulfil such requirements.

Therefore, Plant Research International (PRI) decided to explore the feasibility and applicability of a closed chain in the floristry sector. This study provides a brief overview of the current floristry sector in the Netherlands and details its complexity and specific characteristics. Several closed-chain concepts, extracted from other agriculture sectors, are used as benchmark for a potential introduction in the floristry sector. The most adequate model is identified by comparing specific characteristics of the floristry sector and the limiting/positive factors of the available models, and used as a pattern.

This research was carried out jointly by S.D.C. Deneux and J.H. Luten from the Agricultural Economics Research Institute (LEI).

Managing Director,

A handwritten signature in black ink, appearing to read 'L.C. Zachariasse', written over a horizontal line.

Prof. Dr. L.C. Zachariasse

Summary

The floristry market is becoming more and more customer oriented. As consumers are demanding product information and product guarantees, the floristry sector must analyse the possibilities of product separation. This report looks into the feasibility and potential application of a closed chain within the Dutch floristry sector.

The routes flowers take along the floristry chain are complex. The cut-flower industry in the Netherlands is characterised by a strongly international orientation, the trading of a large and varied assortment, the domination of the auction and the emergence of competitors from abroad.

Different patterns are possible when considering the implementation of a closed chain as present in other Dutch agricultural sectors. The organic sector applies a *separated closed-chain* model, while the meat sector has implemented an *integrated model*. Both patterns have their limiting and positive factors, and both could be applied in the floristry sector. However, the integrated chain model seems more suitable than the separated model, as it better matches the main characteristics of the sector. Important success factors for the implementation of this model are analysed in this research. Such aspects as commitment, product specifications, control system and the role of new technologies play an important role in the successful implementation of a closed chain.

1. Introduction

The floristry market is becoming more and more customer oriented. In order to meet the demands of today's impulsive customers, the floristry sector must enhance its responsiveness to demand fluctuations. This means that in the future the speed at which new varieties and cultivars are introduced will be very important if a firm is to be successful. The use of new biotechnologies will be an important factor in achieving a competitive advantage in the floristry sector. Mixed with conventional goods, new products - whether or not genetically modified - will reach the market.

1.1 Problem statement

With the current supply-chain model, it is hardly possible to separate specific products from standard products. It is difficult for a Dutch consumer to know whether the rose he or she is buying comes from Kenya or was grown according the MPS standard just a few kilometres down the road. Therefore, to preserve the consumer's right to free choice and information, it is important to consider how product flows can be separated.

1.2 Research aim

To explore the feasibility and applicability of a closed chain in the floristry sector and to analyse the critical economic and organisational success factors.

1.3 Research scope

This study focuses on the cut-flower sector and does not consider that of potted plants. Although the two sectors may seem similar, the conclusions of this study may not be directly translatable to the pot-plant chain. The closed-chain concept has both economic and organisational implications. The strong international orientation of the sector was taken into account when studying the feasibility and applicability of such a chain.

1.4 Research structure

Section 2 provides a brief overview of the current floristry sector and details its complexity and specific characteristics. Section 3 discusses several closed-chain concepts introduced in other agriculture sectors, and assesses the positive and the limiting factors of each system. The

specific characteristics of the floristry sector and the limiting/positive factors of the available models are compared in Section 4. The most adequate model is used as a pattern and applied to the floristry sector in Section 5.

2. From grower to consumer: the product flow

This section describes today's floristry sector and emphasises the current organisational aspects and trends.

2.1 An atypical chain

2.1.1 Chain pattern

As flowers travel from Dutch growers to consumers, both abroad and at home, they pass through various stages and are handled by various actors. The organisation of this chain is crucial to the effectiveness and competitiveness of the whole sector: the failure of one part leads to the collapse of the rest. The actors in this chain are partners aiming at a mutual goal.

2.1.2 Multiple choice of routes

The chain is complex and products follow a wide range of different routes before reaching the consumer. The main route - which accounts for 70% of the total product - involves a grower, one of the five auctions, a wholesaler and a retailer. However, some products are not part of this product flow and reach the wholesale or retail trade directly, as shown in the figure below.

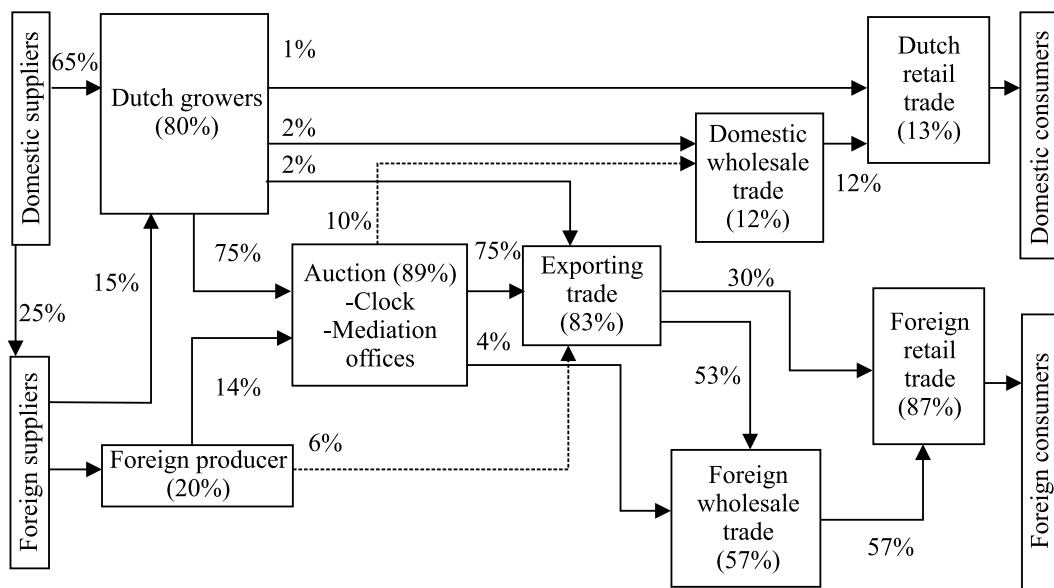


Figure 2.1 The cut-flower distribution channel
Source: Sluys (1990), Rabobank (1992), Deneux (1999).

2.1.3 Movements and new tendencies along the chain

New distribution trends are emerging in the market. Exporters are increasingly attempting to break the chain by buying directly from the growers in order to obtain a product with a consistent quality. New purchasing methods are superseding traditional techniques. The sale of cut flowers via e-commerce is growing rapidly, as are the mediation offices of the auctions, which in recent years have been handling a growing amount of cut flowers. However, the auctions - where the price is gradually reduced until a buyer is found (a 'Dutch' auction) - comprise the main arena for the purchase and sale of flowers.

2.2 Partners in a chain

To trace the route of the product, it is essential to understand the activities performed by each link in the chain.

2.2.1 Suppliers

There is an extensive network of domestic suppliers specialised in the floristry sector. In 1998, the production value of this sector reached 4.5 billion guilders. These larger companies are increasingly operating on an international scale and supplying material to growers all over the world. Some 25% of the total turnover of the sector is realised outside the Netherlands. Also, domestic growers have access to foreign materials supplied by large foreign companies. An overview of the Dutch material supply in the Netherlands is summarised in the table below.

Table 2.1 Overview of the Dutch material supply

	Number of firms in 1998	Average turnover in 1998 (millions of guilders)
Plant material	35	23
Crop requirements	22	44
Machines & installations	42	10
Greenhouses	17	34
Generalist	6	118
Advising company	3	-
Others	9	17
Total	134	27

Source: LEI (1999).

2.2.2 Growers

The production of flowers in the Netherlands is strongly concentrated and benefits from advanced know-how and the advantages of scale. In 1999, some 9,273 growers with a total planted area of 8,526 ha realised a turnover of 7.2 billion guilders. Growers obtain their material from specialised suppliers, which have the benefits of best technology with regards to biotechnological practices. Furthermore, communication between Dutch growers is very strong, and growers meet regularly to participate in workshops and professional discussions.

Foreign producers can also sell their products via the Dutch chain. The difference in season between the Netherlands and other countries offers interesting possibilities to foreign growers when it comes to supplying the Dutch cut-flower assortment in the summer. In total, the Netherlands imports cut flowers from about 50 different countries. Between 1996 and 1999, imports grew at an annual rate of 6.7%. Foreign cut-flowers are combined with domestic products and sold at auction. The share of foreign flowers at auction varies from 6 to 15% and is difficult to regulate. Important import countries are Kenya (30%), Israel (29%) and Zimbabwe (18%).

Table 2.2 *Import value (millions of guilders)*

	1996	1999	Annual growth %
Cut flowers	1,322	1,675	+6.7

Source: PT (2000).

Growers place their products in the auction package, which is then placed on the auction's trolleys. After the delivery form has been completed, the trolleys are taken into the auction. Growers do this themselves or leave it to professional transporters (group transport). Also specialised transport companies take the products to auction.

2.2.3 Auction

The auction plays an essential role in the floristry chain. It is here that supply and demand is concentrated, where prices are established and the market becomes transparent. The auction also makes contacts easy between chain actors and thereby promotes communication and the transfer of information, even though contacts are not always direct.

The auction has two sales instruments. Although mediation offices are becoming more and more involved in the trading of cut flowers, the clock remains the main sales instrument.

- *The clock:* as soon the growers' products have been scanned, the trolleys are moved to the auction's cool store where the products are separated (roses with roses, chrysanthemums with chrysanthemums, et cetera). Shortly before the products are sold, quality inspectors carry out a quality control inspection to ensure that products meet the quality norms. Samples are then taken to the auction room where buyers are waiting to purchase the products. The buyers can find all the necessary information on the clock, i.e.

the name of the grower, the quality, special label, et cetera. By pressing a button, the buyer becomes the owner of the lot. Immediately after a product is sold, it is moved to the distribution hall and then delivered to the buyer hall.

- *Mediation offices:* The auctions' second sales instrument is the mediation office. Flowers but mainly pot plants are sold by means of mediation between growers and buyers. Growers bring a sample of their product to the mediation office, which then finds a buyer and receives a commission. These offices are growing in importance.

Table 2.3 Turnover of Dutch auction

1999	Auction turnover	Annual growth %
Total turnover	4,590 million guilders	0
Clock	92%	-1.3
Mediation offices	8%	+14

Source: VBN (2000).

2.2.4 Wholesalers and exporters

Domestic wholesalers and exporters purchase their products at auction. They prepare the products for shipment and then send them across the country and/or across the border by truck or plane.

- Domestic wholesalers distribute their products via the domestic retail chain. This process involves about 15% of all cut flowers.
- Exporters can be divided into two categories: those who supply the foreign retail trade directly (supermarkets, garden centres, large flower shops, chain stores) and those who prefer to sell their products to foreign wholesalers, who distribute the products to the foreign retail trade channel. In 2000, a total of 1,218 exporters exported cut flowers worth 6,274 million guilders.
- Foreign importers may also buy products at auction; recently, some have applied for membership of auction halls.

2.2.5 Retailers

Each country has its own retail distribution network. In some countries, products reach the consumer via street vendors, while in others supermarkets realise the largest sales. Furthermore, new forms of distribution are appearing in many countries, such as sales at petrol stations and via e-commerce. The retail outlets for floristry products are becoming more varied. In general, cut flowers reach the consumer via:

- flower shops;
- supermarkets;
- garden centres;

- market vendors;
- street vendors;
- petrol stations.

The percentage of the total sales volume realised by each of the above actors differs from country to country.

2.2.6 Consumers

Consumer needs have changed. Demographic developments, the emergence of global marketing strategies, the rapid dissemination of information through the media, and governments have strongly influenced consumer behaviour, so that nowadays firms have to deal with a capricious, impulsive, powerful and unpredictable consumer.

E.M. Steenkamp (1997) identified several major trends in consumer food behaviour. These trends arise from collective growing issues that affect consumer behaviour in general. Therefore, some of these trends can be translated to non-food products. One of the major trends is the growth in *environmental and ethical concerns*. Products that are harmful to the environment or are produced in an environmentally unfriendly way are encountering growing consumer resistance. Moreover, ethical issues related to production processes - such as animal welfare, child labour and GMOs - are becoming more important. Today's consumers are, in general, more involved in these collective issues and want to know exactly what they are buying (How was this product produced? Where does it come from? Through which process did it go?). Therefore, all the information relevant in one way or another to a product must be easily accessible to the consumer. A product is not considered on its own, but is associated with the information relevant to it. This total package (product + information) must be delivered to the consumer. These requirements demand new methods in terms of traceability, information exchange and the organisation of flows, and question today's traditional supply-chain organisation.

To summarise, flowers flow from producer to consumer along a complex chain. The specific characteristics of the Dutch floristry chain are summarised below in five key facts that are essential to consider when designing a closed-chain concept.

	<i>Key facts</i>
<i>The floristry chain</i>	Auction plays a central role Strong international orientation Complex chain with multiple product flows Large and varied assortment Intense competition from other countries

3. Closed-chain models

This section defines the term closed chain and reviews several closed-chain models applied in other agriculture sectors. The positive and limiting factors of each system are assessed.

3.1 Definition

A closed chain focuses on a certain type of product for which it allows complete traceability from producer to consumer. The relevant product is separated from the mass of goods (or conventional product flow) in such a way that the flow of this product is closed to other goods. These criteria can be implemented by means of various techniques, such as flow separation, certification and labelling.

3.2 Patterns and product flows

One function of a closed-chain model is to separate certain types of product from conventional ones. Two organisational models are presented here along with their limiting and positive factors.

3.2.1 The separated closed-chain model applied to organic products

This model (see figure 2.1) separates certain products from the rest by means of a separated flow. Certain products never come into contact with standard products and thus cannot be mixed. A separated chain is comprised of specialised producers, wholesalers and retailers who have decided to collaborate in supplying in certain categories of product, and who also participate in the conventional product flow. To ensure conformity with the collective practices, an independent organisation performs controls and checks to ensure that each partner fulfils its role in the process flow.

For such a model to be effective, enough entrepreneurs prepared to individuate themselves from the rest need to be willing to participate in the project. A shortage of actors or a shortage of range/volume of products will lead to the collapse of the entire chain. Large investments are necessary to establish such a chain. A complete separated chain must be established from scratch.

The product characteristics guaranteed by the chain must be highly valued by a certain group of consumers in order to generate high profit margins. The high costs of the chain can then be absorbed through high product prices. A certifying organisation must be available to guarantee the whole process and prevent the possibility of fraud.

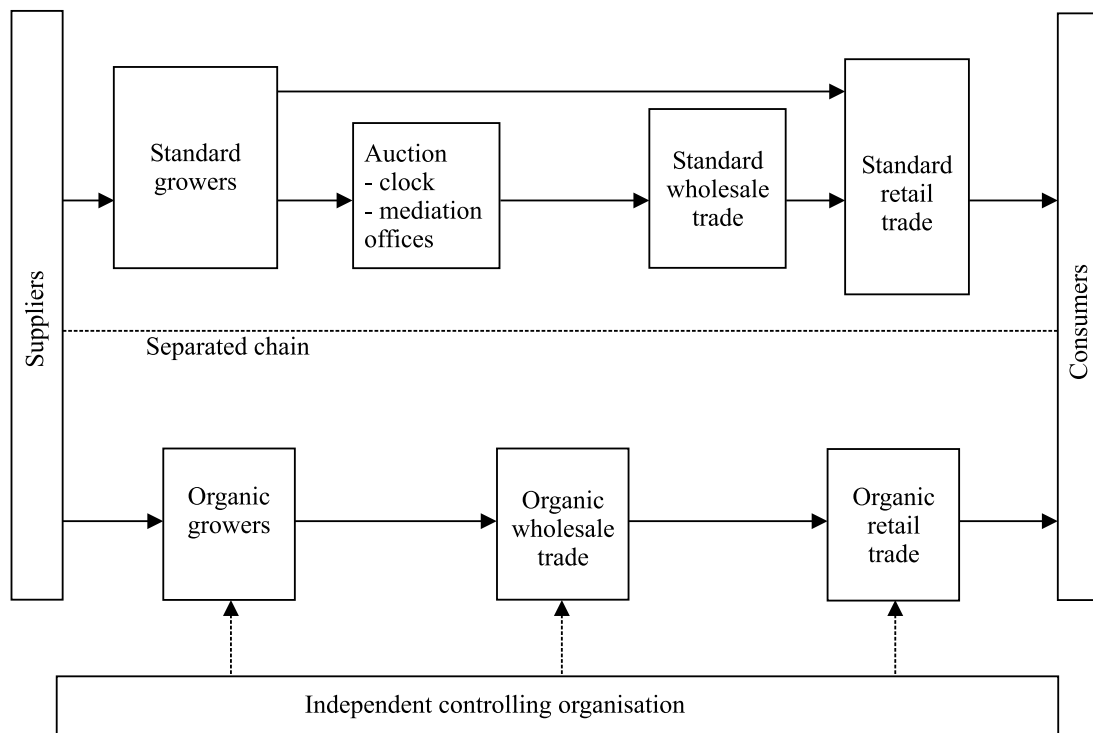


Figure 3.1 A separated closed-chain for organic products
Source: Zimmermann, Borgstein (1993).

3.2.2 An integrated closed-chain model

An alternative is to implement an integrated closed-chain system, i.e. actors within a well-established chain separate a certain product type from the others by branding the products. In this way, even though the two product flows are not physically separated, they are at all moments distinguishable. Of course, an integrated closed-chain requires the collective, proper use of stickers, numbers or labels as well as meticulous registration along the chain. This is guaranteed by an independent controlling organisation, which ensures the correct practices of the certified companies. This model has been established in the meat sector for quality products (e.g. IKB product in the pork sector and Label rouge in the French beef sector). The figure below illustrates the integrated closed-chain model implemented in the meat sector.

As such a system requires only small investments and no fundamental organisational changes, its implementation is easy. Furthermore, in the case of an integrated closed-chain, specific products are added to the standard product range. This increases the possibilities of the chain actors rather than restricts them, which makes it a lot easier to attract entrepreneurs to the system. However, this model must be governed by a drastic controlling system, one which certifies organisations and controls the correct utilisation of labels, stickers and/or identity numbers. The registration paperwork behind the product must be accurate.

Promotional activities and communication campaigns ensure consumer awareness of the available new label.

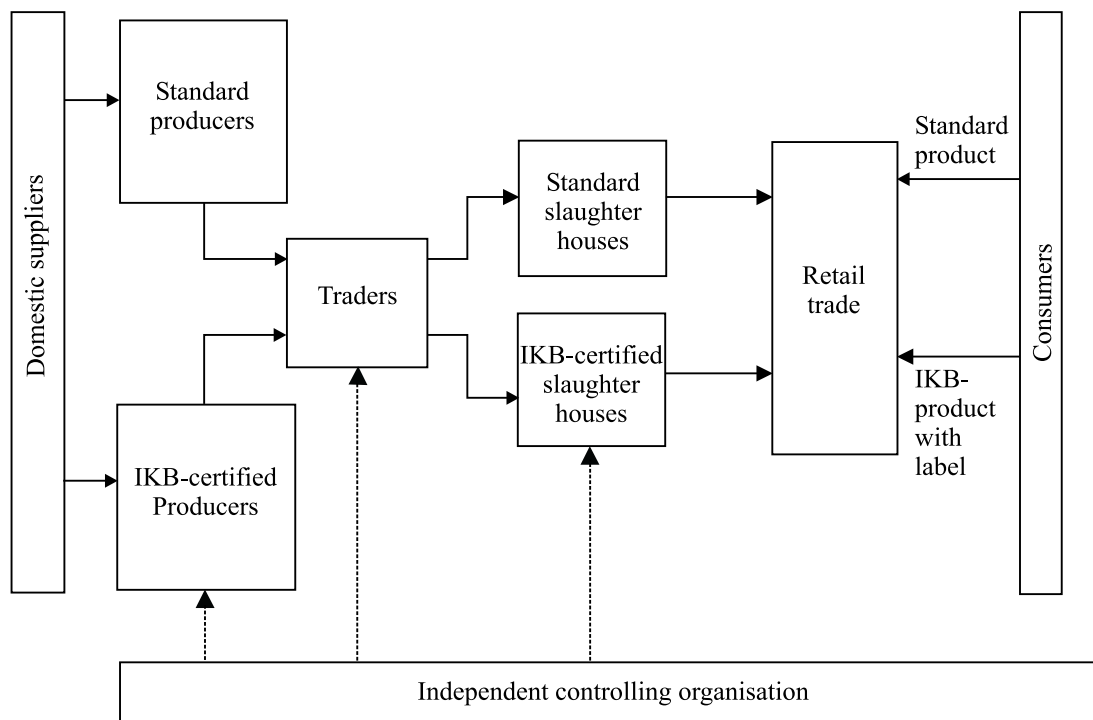


Figure 3.2 Integrated closed-chain model implemented in the meat sector, PVE/IKB
Source: PVE.

3.3 Limiting and positive factors

The limiting and positive factors of both systems are summarised in the table below.

Table 3.1 Positive and limiting factors of separated and integrated closed-chain models

Closed-chain pattern	Limiting factors	Positive factors
Separated	Large infrastructure cost Large range of products Small capacities of each parties	Effective assessment of product characteristics Simplicity of system Effective logistics
Integrated	Possibility of fraud Confusion within the chain Certifying institution available	No large organisational changes Small investment Accessible to all entrepreneurs

4. Feasibility of several closed-chain models for the floristry sector

Figure 4.1 presents the limiting and positive factors of each model vis-à-vis the specific characteristics of the Dutch floristry sector.

Closed chain model	Floristry key-facts					
	Central role of auction	Deep assortment	Complex chain	Intense competition	Multiple product flows	Strongly internationally oriented
<p><i>Separated</i></p> <ul style="list-style-type: none"> * effective assessment of product characteristics * simplicity of the system * effective logistics * large infrastructure costs * large range of products * small capacities of each parties 		-	+	+		-- -
<p><i>Integrated</i></p> <ul style="list-style-type: none"> * no large organisational changes * small investment * accessible to every intrepeneur * possibilities of fraud with the stickers * confusion within the chain 	+		-	-		++ +

Figure 4.1 Applicability of two closed-chain models to the floristry sector

+ = match

- = bottleneck

Either model could be applied within the floristry sector, but in both cases an effort would have to be made to ensure successful implementation. However, for financial and organisational reasons, an integrated closed-chain model is more appropriate to the sector's characteristics.

4.1 Closed-chain success factors

Whichever model (integrated/separated) is adopted, several conditions must be fulfilled in order to ensure its successful implementation. These conditions are:

- *Strong integration*
The floristry chain is complex and has a specific distribution pattern. The implementation of a closed-chain model would involve a new flow organisation, as well as strict restrictions and detailed rules to be complied with by every partner in the chain. For a successful implementation, it is important that the strong integration of and collaboration between all actors - from grower to retailer - links each part of the chain and thus ensures an effective product flow and a collaborative organisation. Each part of the chain must fulfil its own role;
- *Product specifications*
A closed chain deals with certain categories of product, which possess specific characteristics and in which consumers/trading partners are interested. The product specifications must be clearly laid out and standardised to make their application possible by the various parties involved as well as to allow the specifications to be controlled. This means that modes of production, logistic procedures and other specific requirements must be predefined;
- *Price effect*
Because of the strict specifications (rigorous requirements, small scale, and complex organisation) that must be respected with the implementation of a closed-chain model, product costs are higher than in a standard chain model. This difference must be compensated for in the eyes of the consumer by a higher value of the product. This means that a certain category of consumers must be ready to pay more for the indicated product characteristics (information, quality);
Therefore, before implementing a closed-chain model, it is crucial to discover whether certain consumers have an interest in the product type concerned. Questions must be asked and the answers analysed before the implementation stage, for example: which characteristics must be indicated? How should these characteristics be formulated? Is there a market for a product with these characteristics?;
- *Control system*
The implementation of a closed chain is only worthwhile if such will provide the consumer with total assurance regarding the correctness of the product characteristics. The integrity of the whole closed-chain must therefore be legitimated.
The only way to reach a satisfactory degree of certainty about product characteristics is to implement rigorous control systems all along the chain. An independent organisation must be able to control the chain members in order to ensure that the predefined practice and other specifications are respected. Each intermediary - from grower to retailer -

must be controlled in order to guarantee the correct use of labels, stickers, identifying numbers and other separating methods.

Furthermore, the Dutch floristry sector operates world-wide: it imports approximately 15% of its product and exports approximately 70% of domestic production to foreign markets. A closed chain in the floristry sector must maintain this world-wide scope and include both imported (foreign growers) and exported products (foreign distribution channels). Therefore, control systems must be arranged at the international level in order to guarantee the quality of imported goods; also the common specifications of foreign wholesalers and retailers must be respected;

- *New technology*

Information exchange plays a crucial role in the performance of a closed chain. Product quality, logistics (tracking and tracing) and marketing require intensive data exchange along the chain. Therefore, the implementation of IT systems is a crucial aspect in the success of such a system. IT improves co-ordination at the interface between customer and supplier and creates efficiencies, such as the better management of inventory levels and improved data exchange between the organisations involved. Because inter- and intra-organisational transactions play a central role in a closed-chain system, an EDI system (Electronic Data Interchange) is indispensable. With an integrated closed-chain, the logistics are quite complex. Therefore, the implementation of new technologies contributes to an increase in efficiency and security throughout the process. Bar-coding, positioning systems and satellite-tracking systems are examples of such technological developments.

5. Applicability of a closed chain to the floristry sector

The applicability of both systems is presented here. The integrated closed-chain pattern (figure 5.2) is given more attention, however, as it seems more suitable for the floristry sector.

5.1 Separated closed-chain pattern

The separated closed-chain model could be implemented in the floristry sector, but such would entail large infrastructural and organisational costs. The retail trade would distribute certain products. The assortment must be large enough to satisfy client needs. The figure below shows how this model could be applied to the floristry sector.

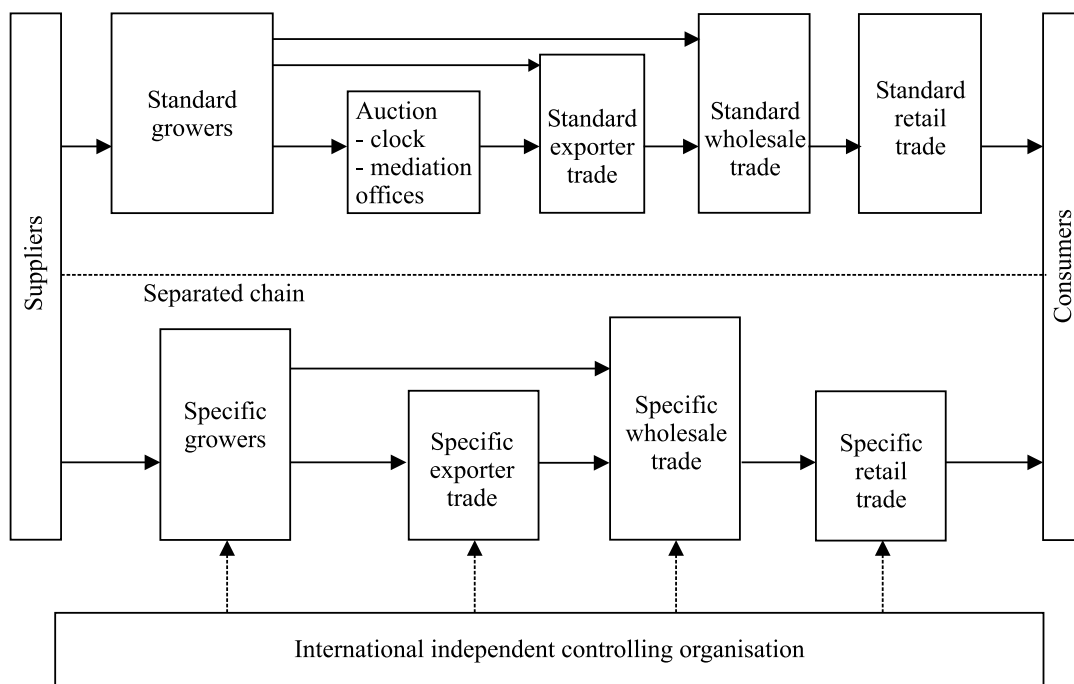


Figure 5.1 A separated closed-chain in the floristry sector
Source: Deneux (1999).

5.2 Integrated closed-chain pattern

An integrated closed-chain model could be implemented in the floristry sector. The figure below shows how this could be done.

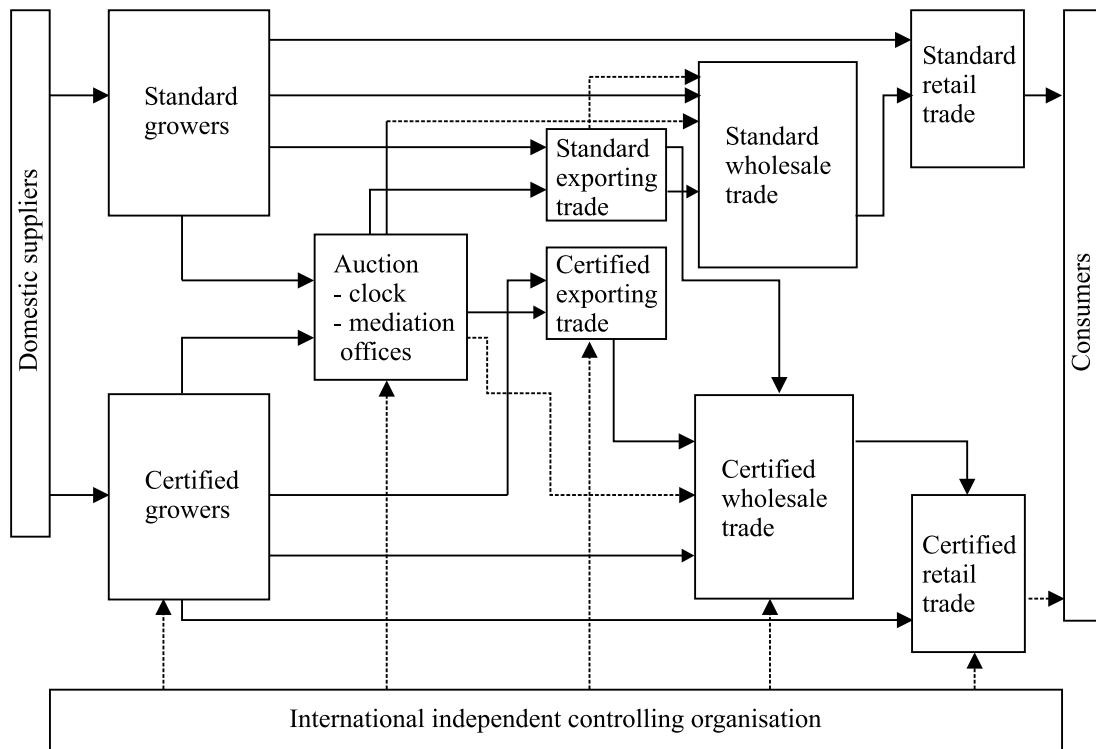


Figure 5.2 An integrated closed-chain schema in the floristry sector
Source: Deneux (1999).

5.2.1 Practical implications

One objective of a closed-chain system is to ensure the origin of the product vis-à-vis the consumer. This means that the system must ensure the uninterrupted supply of information along the entire chain, in order to provide the consumer with assurance regarding food safety, healthcare and other relevant information.

Several tracing methods can be used to ensure reliable traceability along the chain. For instance, the grower's identity number (which is displayed on the clock screen) is an interesting basis on which to develop a tracing system.

An example of a traceability system in an integrated closed-chain is presented below. The application of such a system requires little investment. The diagram illustrates the organisation of an integrated closed-chain; implementation measures are analysed per chain actor.

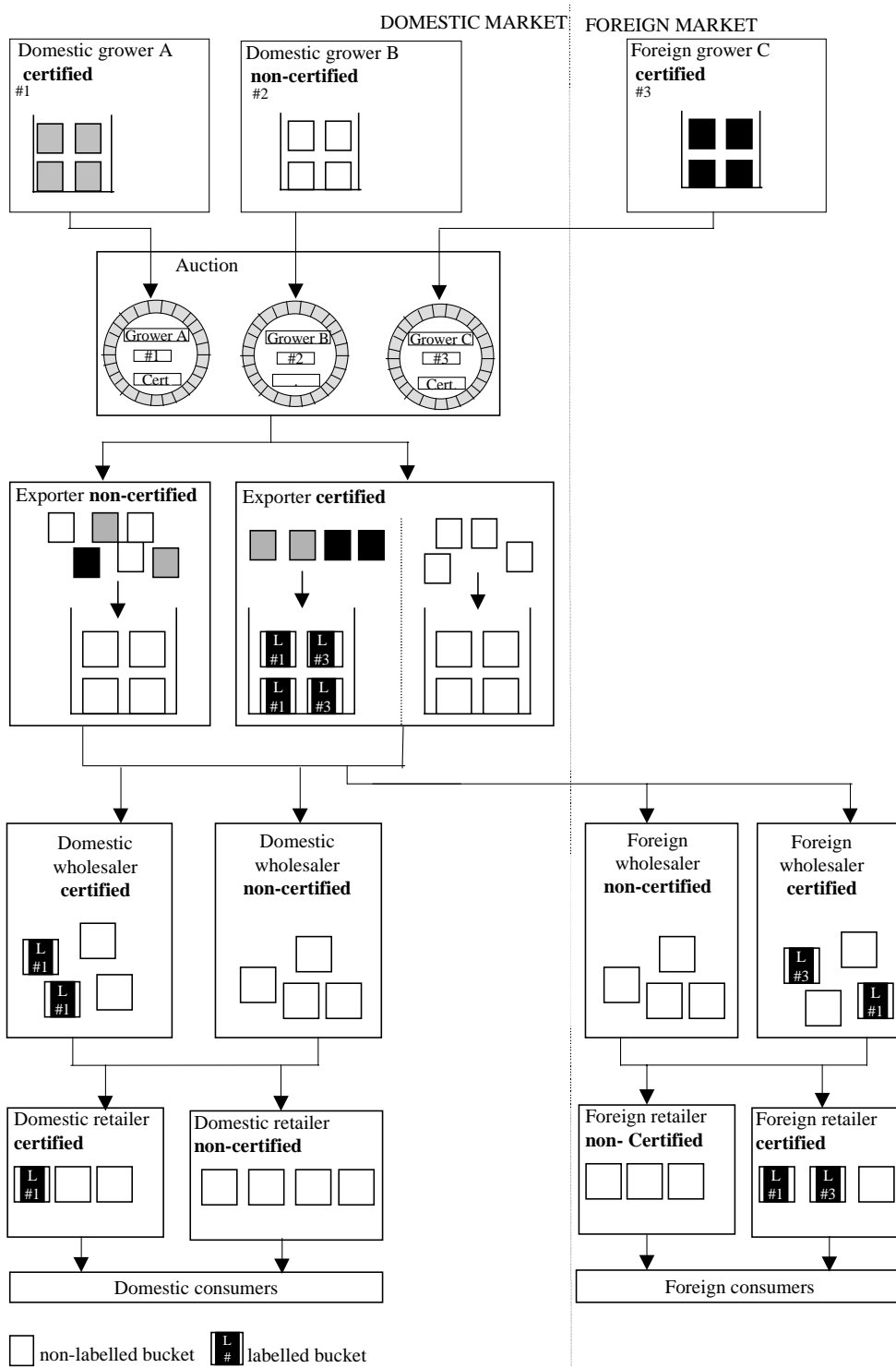


Figure 5.3 A closed-chain model in the floristry sector

5.2.2 Suppliers

Suppliers are responsible for the introduction of the different varieties of plants. They are the ones who possess the information regarding the nature of the future flower. Therefore, suppliers must specify during the transfer the nature of the material. An independent control mechanism must regularly verify the authenticity of delivered information.

5.2.3 Growers

Certified growers must respect the defined specifications in order to produce products with the right characteristics. The controlling organisation must regularly perform controls at the growers to guarantee their compliance with the rules.

5.2.4 Auctions

Each grower is characterised by a number, which appears on the auction screen during the selling process, thus allowing specific products to be differentiated from standard products and to be traced back to the grower. Furthermore, to indicate to the buyers which characteristics an auctioned product has, a label could be added on the auction screen to differentiate standard products from specific ones.

5.2.5 Exporters

Certified exporters must continue the tracing information in order to pass it on to the following level of the chain. This means that exporters must separate specific products from standard products. They must transfer the grower's number to the specific products and apply the relevant labelling sticker to them. In this way, standard and specific products can be differentiated by the sticker plus the number of the originating grower, allowing the origin of labelled products to be identified. Here again the certainty of the system depends on the quality of the controlling organisation.

5.2.6 Wholesalers

Certified wholesalers must continue the transfer of information, by utilising the labelled stickers and the grower's identity number.

5.2.7 Retailers

Certified retailers offer standard products as well as labelled products to their customers, certifying certain product characteristics as well as providing tracing possibility for labelled products.

Practical requirements

Various practical requirements also need to be mentioned.

Import/export

About 15% of the sector's product is imported. This growing capacity can also be integrated into a closed-chain framework. Foreign producers could be certified and be regularly controlled by the controlling organisation. This means that the independent control organisation must be an international one, such as SGS AgroControl, which is involved in the control of the MPS label.

Following the same scheme, foreign wholesalers and foreign retailers could be certified. This is important if one bears in mind that 70% of the products are exported. Foreign consumers should also have the possibility to choose labelled products. The international control organisation would ensure that foreign partners respect the specifications and transfer the flow of information to the foreign consumer.

Bouquets

Bouquets include different species of flowers from different origins. The traceability of such goods is really complex. Because a bouquet by definition combines several origins of flowers, tracing the origin of a bouquet means marking the origin of each flower in the bouquet. However, although it is possible to label certain types of bouquet (because they have certain characteristics, such as being environmental friendly or GMO-free), it is not possible to state the origin of each flower in a bouquet.

6. Conclusion

The application of a closed-chain model within the Dutch floristry sector can be realised according to two different patterns. The organic sector implements a separated closed-chain model, while the meat sector uses an integrated model. For cost and structural reasons - and with regards to the specific characteristics of the sector in question - the integrated model appears the better choice for the floristry sector.

However, the application of such a system will require practical modifications at every level of the chain (tracking and tracing system) and entail other matters crucial to the success of the system. Price effect, the commitment of partners and the availability of an independent auditing organisation are just some of the possible underlying bottlenecks involved in the implementation of a closed chain. Moreover, the strong international orientation of the floristry sector with its large-scale imports and exports raises other crucial issues that make such a concept even more complex.

However, increasing consumer concern regarding biotechnological practices on the one hand, and the importance of product innovation in maintaining a company's success on the other hand, will motivate entrepreneurs in the floristry sector to distinguish themselves by investing in closed-chain implementation.

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