COMPETENCE NETWORKS IN THE FOOD INDUSTRY IN AUSTRIA

CHALLENGES, OPPORTUNITIES AND STRATEGIES FOR COOPERATION

DIPLOMARBEIT

zur Erlangung des akademischen Grades
einer Magistra
der Sozial- und Wirtschaftswissenschaften

eingereicht bei Frau
O.Univ.-Prof.
Anna NAGURNEY, Ph.D
Institut für Wirtschaftstheorie, Wirtschaftspolitik und Wirtschaftsgeschichte
Sozial- und Wirtschaftswissenschaftliche Fakultät
der Leopold-Franzens-Universität Innsbruck

von
Tina WAKOLBINGER

Innsbruck, August 2002

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1 Introduction

The food industry in Austria has to face its severe problems. The main problems are: increasing global competition, extremely high concentration in the retail industry, and consumers that are becoming more and more critical. Necessary responses to these developments are among others: successful new product innovations and increased exports. As the industry mainly consists of small and medium-sized companies that often have neither the resources nor the knowledge to develop successful innovations and conquer new markets, a stronger cooperation of the companies with universities and research institutes and a stronger cooperation between the companies is essential.

These cooperations offer high potential gains but major obstacles often hinder their creation. To support these cooperations competence networks have been created in the food industry during the last four years, each unique in its creation, its goals and its structure.

This paper will describe the challenges, the opportunities, and the strategies for cooperation in the food sector. It is organized as follows:
The first part describes the situation of the food industry and its problems.
The second part shows the most important potential gains of cooperation and obstacles that may prevent the realization of the cooperation.
The third part describes five newly evolving competence networks, their structures, strategies, goals, and problems. I also try to analyze if the approaches of the different networks are likely to be successful and give some advice on how to improve their strategies.

2 Current situation of the food industry in Austria

The first part of the paper describes the situation of the food industry in Austria, one of the main industries in Austria, that has to struggle with many problems at the moment. These problems are partially due to global developments that are not in favor of food producers and they are partially due to special facts in Austria. After an analysis of the industry with the instrument of an analysis of the five forces according to Porter, this chapter will be concluded with some recommendations of necessary steps in the future. This part will stress why cooperation and the creation of competence networks in the food industry is vitally important for the companies to survive.

2.1 Important indicators of the sector

At the beginning of this paper I would like to give an overview of the main economic indicators of the food industry in 2000, the latest period for which extensive data is available. In one case I have to use data from 1995.

2.1.1 Size of the industry

The food industry is one of the main industries in Austria. In 2000 the Austrian food industry (all companies with more than 10 employees) achieved a production value of 75,2 billion Austrian Schillings according to the statistic of economic cycle in 2000. This means a slight increase of 1,3 % in comparison to 1999.[1]

To determine the importance of the food industry in Austria it is also necessary to have a look at the whole value chain of food production, not only food producers. Many other industries depend on the well-being of this industry. Around 500.000 people work in the value chain for food production in Austria. This is around every seventh employee. Around 300.000 billions ATS are created along the value chain. This constitutes around 11% of the Austrian social product.[2]

[1] see Domschitz, 2000, p. 3 f

2.1.2 Expenses for R&D and investments

In 1995, the expenses for R&D were, with an amount of 0,6 % of value added, significantly below the already low average of 4,2 % in the Austrian industry and below the average of the EU-countries in this industry. [3] The percentage of 0,6 was after Paper/Printing and Ship the third lowest in the whole industry. These 0,6 % correspond to 19.800 Euros. [4] Nevertheless, the percentage of Austrian patents in the world was higher in the food and tobacco sector than in the total economy. This fact reflects Austrian industry specialization because Austria focuses mainly on industries with low to average technology intensity. [5]

According to WIFO, investments reached 5,86 billion Austrian Schillings which means a strong increase by 20 %. [6]

2.1.3 Negative developments

- The Austrian food sector is responsible for around one fifth of the Austrian foreign trade deficit.
- Only the production of beverages without alcohol is internationally above average competitive. A very prominent example for this industry is Red Bull. [7]
- The whole food industry including retail had to face 201 insolvencies with an amount of 1,3 billions Austrian Schillings. [8]
- The number of companies at the end of the year was 262 (-1,9 %). This number has been constantly decreasing over the last couple of years.
- The industry employed 29.021 employees, (-1,1 %). Also the amount of employees has been constantly decreasing.
- In 2000 the general consumer price index increased by 2,3 % but the index for food increased by 1,1 %. The development of the prices of the last 10 years shows that during the last several years the increase in the prices in the food industry, an increase of 1,3 % on average, has been the lowest of the whole economy. [9]

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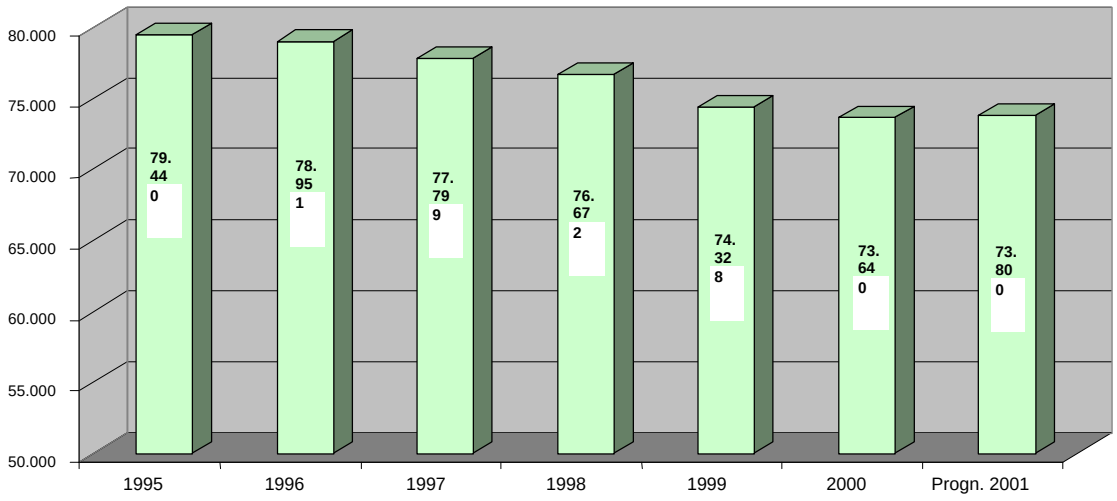
[2] see Payer et al in: Buchinger, 1999, p. 79
[3] see Hutschenreiter et al, 1999, p. 11
[4] see Schartinger, Gassler, Schibany, 2000, p. 6
[5] see Austrian Ministry for education, science and culture, 2001, p. 60 f
[6] see Domschitz, 2000, p. 3 f
[7] see Peneder 1994 in: Handler, 1998, p. 242
[8] see Domschitz, 2000, p. 1
[9] see Domschitz, 2000, p. 1

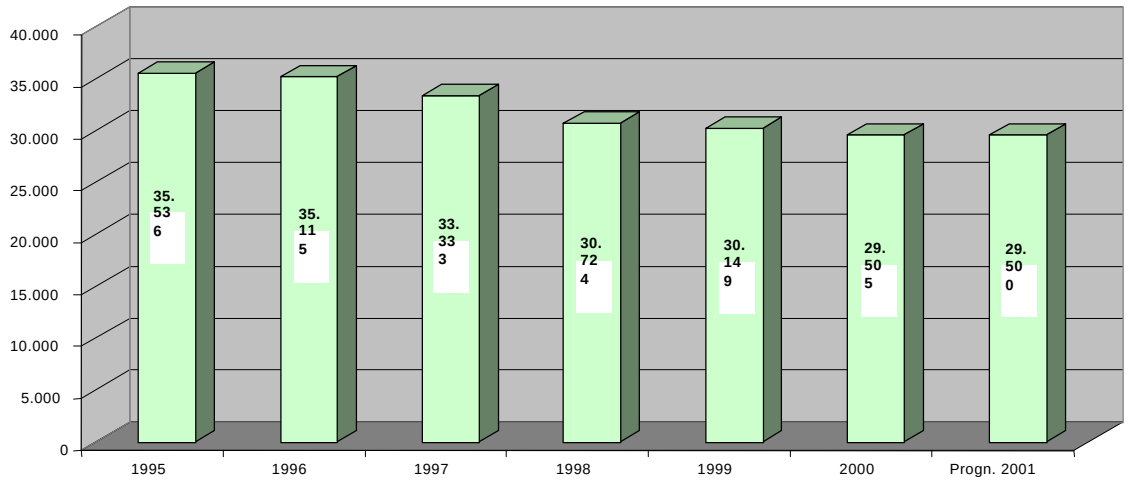
The following graphs that are based on data from the Austrian Chamber of Commerce, which shows slight differences to the data from the business statistics, also shows the negative developments in the industry. The annual turnover, average number of companies as well as the number of employees had been constantly decreasing from 1995 until 2000.

Figure 2.1-1: Annual turnover: Austrian food industry 1995 – 2001 (Projection)



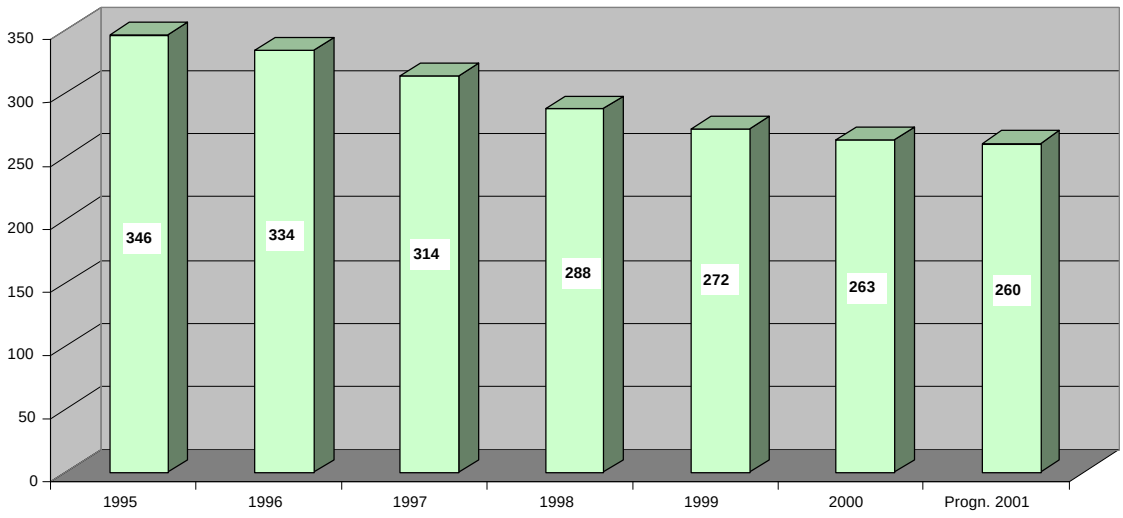
Source: Industrial union of the food industry: www. dielebensmittel.at/statistik

Figure 2.1-2 Average number of employees: Austrian food industry 1995 – 2001 (Projection)



Source: Industrial union of the food industry: www. dielebensmittel.at/statistik

Figure 2.1-3 Average number of firms: Austrian food industry 1995 – 2001 (Projection)



Source: Industrial union of the food industry: www. dielebensmittel.at/statistik

2.2 Reasons for the problems

In this chapter I try to identify the main reasons for the unfavorable developments in the Austrian food sector, that consists mainly of small and medium-sized enterprises (SMEs). Furthermore, I will analyze whether the unfavorable developments are likely to continue in the future.

In the first part of this chapter, I focus on global problems that food producers, especially SMEs, have to face and in the second part I describe the special problems in Austria.

2.2.1 Global difficulties for small food producers

While the situation in the food industry has always been very stable there have been some significant changes in the past several years. All of these changes have worsened the situation of the food manufacturers, especially SMEs, and as these trends are expected to continue they will further worsen the situation of the food industry and it will become harder for SMEs to survive. The main trends are the following:[10]

2.2.1.1 Increasing international competition

The consolidation and internationalization in the food retail and manufacturing industry will continue. In the near future four or five large retailers and about 10 manufacturers will operate on an international scale. No Austrian company is among the ten biggest food producers in Europe. These companies constitute an increasing threat to the local dominant companies. Their main advantage is that they have high financial resources and can therefore invest high amounts of money into R&D and marketing. Furthermore they attract the attention of qualified personnel. This trend is supported by the increasing mobility of European employees, especially well qualified young professionals.

Countries from the second world are very likely to become strong competitors. They will learn to exploit the possibilities that their ideal ecological and biological conditions offer to them and can operate with lower costs. The enlargement of the

[10] see Gap Gemini Ernst & Young, 2000, p. 1 ff

EU will further enhance this process and put strong pressure on Austrian food producers. The enlargement of the EU is not only a threat but offers also high potential profits as Austrian food producers are very successful in exports to these countries. [11]

2.2.1.2 Increasing power of the retail sector

Retailers will have an increasing influence on the supply chain. They are likely to force food producers to participate in cooperations that are strongly dominated by the retailers. Retailers are less and less willing to buy individual products or assortments. Rather, they will buy – and control – the total process, from ingredients through production, ensuring that the finished product will meet the needs of consumers. In addition, they will try to reduce the amount of suppliers to reduce complexity. Hence, it will become more difficult for SMEs to sell their products. The special importance of the problem of high concentration in the retail sector in Austria will be mentioned in the next chapter.

2.2.1.3 Missed opportunities to follow trends set by A-brand manufacturers

To counterbalance the increasing role of the retail industry A-brand manufacturers apply two main strategies:

Increasing expenditure on R&D

Many A – brand manufacturers want to concentrate on improving product innovation to balance retailers' growing power. This will require significant R&D investment, perhaps even double the current budget. As the small and medium-sized companies do not have large enough budgets it will be quite hard for them to react to these trends.

Increasing use of direct selling techniques

Manufacturers are increasingly trying to do direct selling through vending machines, factory stores, offices, catering services, and the internet, which offers a good possibility to them to become more independent from the retail industry. Again, it is very hard for small companies to exploit the potential benefits of these new direct selling methods.

[11] see dielebensmittel.at/Dokumente/statistik/aussenhandel.htm

2.2.1.4 Better informed and more demanding customers

Consumers are becoming more sophisticated about global food products and they will demand products from many countries. They get to know many products on their journeys and will demand to buy these products also at home. Consumers become more aware about their health and demand products with less sugar and fat. The importance of convenience food will increase. In Germany, for example, the production of convenience products increased by one third between 1991 and 2001. Main reasons are more single households and the increasing employment rates of women. [12] It is quite difficult for small manufacturers to react to these trends and develop completely new products as they do not possess the necessary technology and financial resources.

2.2.1.5 Increasing importance of technology

Technology will play an increasing role and the ability to handle new technology will determine who wins and who loses the battle. Currently, many companies do not know how to cope with the huge amounts of data that are at their use. Technology will help them to transform this data into useful information that helps them to develop new products. Furthermore, the increase of technology will help companies to strengthen their relationships with suppliers and customers. [13] For small companies it is often very difficult to employ an expert with the necessary knowledge and to keep him informed and up to date. Hence, SMEs often cannot use the available information and miss many possibilities for differentiation and cost reduction.

2.2.2 Special problems in Austria

Whereas the food industry is, despite its problems, a successful industry worldwide, it has to face severe challenges in Austria. [14] As mentioned above the food industry was characterized by reduction of companies, employees, and turnover. The reduction in the number of employees as well as the reduction in number of the companies is a trend that could be observed in the whole Austrian industry in 1999 and 2000. But whereas the industry as a whole could increase the volume of sold production in this period, the amount of sold production decreased in the food

[12] see Heyman, 2001, p. 27
[13] see Porter, 1998, p. 80 f
[14] see Aiginger in: Buchinger, 1999, p. 24

industry in 2000. [15] This is especially surprising as high consumption and a very positive development in tourism, which is a very important factor for the Austrian food industry, could have helped the industry to increase its sales. It is also surprising concerning the fact that Austrian food and beverages is one of the industries that showed above average innovation achievement in 1995 in the European Union. [16] The main reasons for these unfavorable developments are the following problems:

Centuries of protection

The main reason for the problems of the Austrian food industry is that the Austrian food industry had been protected for many centuries before Austria became a member of the EU. Protection of the market and strong regulation reduced competition. Due to low competition, companies were not forced to develop good marketing strategies, to create outstanding product and process innovations, to reduce costs and to participate in cooperations.

After Austria had become a member of the EU, the food industry had to face strong competition and the export-import balance immediately worsened significantly. [17] This is a strong indicator for the fact that the Austrian food industry was not competitive at this time. After having lost many customers to companies in other EU-member countries, the Austrian companies had to adapt to the new situation. Especially prices were too high and, hence, an increase in productivity and a reduction of companies and employees was inevitable. This development is normal in a phase when protected markets are opened. The Austrian food industry managed to adapt to the new situation and exports started to increase again in the following years.

Structure of the industry

Despite increasing exports, turnover decreased in Austria while it increased world-wide. One of the main reasons for this development is the fact that Austrian industry consists mainly of SMEs and can, hence, not profit from some new developments that allow for higher turnover. The main developments are: new channels for sale and new product lines like convenience food and functional food. These new product

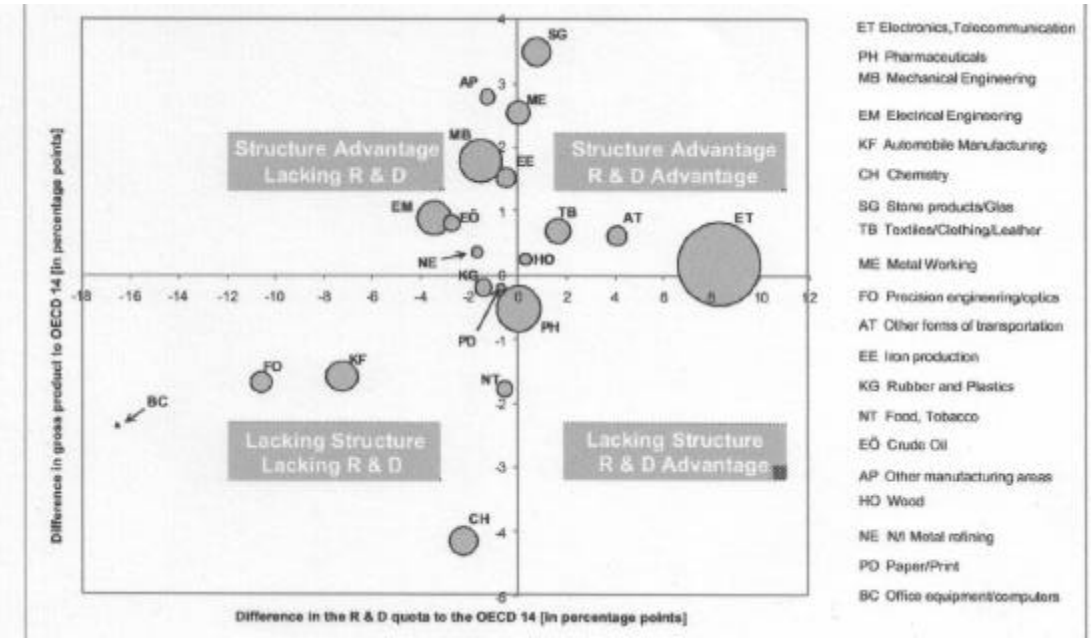
[15] see Windisch, 2001, p. 6
[16] see Buchinger, 1999, p. 1
[17] see www. Dielebensmittel.at/dokumente/statistik/aussenhandel.htm

lines demand a significant input of R&D and financial resources. Hence, SMEs are often not able to participate in these markets.

Deficits in technology

The structure of the industry and other factors, like the weak links between industry and research institutes, cause deficits in technology which are shown in the following table. Food industry and tobacco is one of the industries which lack in structure as well as R&D. In 1995 the food industry had a lower share of gdp in percentage points as well as a lower R&D quota than the OECD 14 countries.

Figure 2.2-1 R&D expenditure and structure portfolio for the sectors of the Austrian tangibles industry 1995



Source: ÖSTAT, OECD, based on Gassler H. Polt W. Rammer Ch. 1999 in: Polt et al, 1999

Strong concentration in the retail industry

The home market constitutes the main market for the biggest part of the Austrian food industry. As this market is dominated by large retailers prices are low and can not be increased. Austria is, after Switzerland and the Scandinavian countries, one of the countries with the strongest concentration in the retail business. This concentration and, hence, the bargaining power of the customers further increased in

2000.[18] The market share of the Top 2 (Billa and Spar) increased from 60,0 % to 62,6 % and the market share of the Top 5 increased from 82,2 % to 86,0 %. The competition between the retail companies is very strong and they compete mainly with low prices. Hence, food manufacturers, which are often SMEs have very small bargaining power and cannot increase the prices of their products. [19]

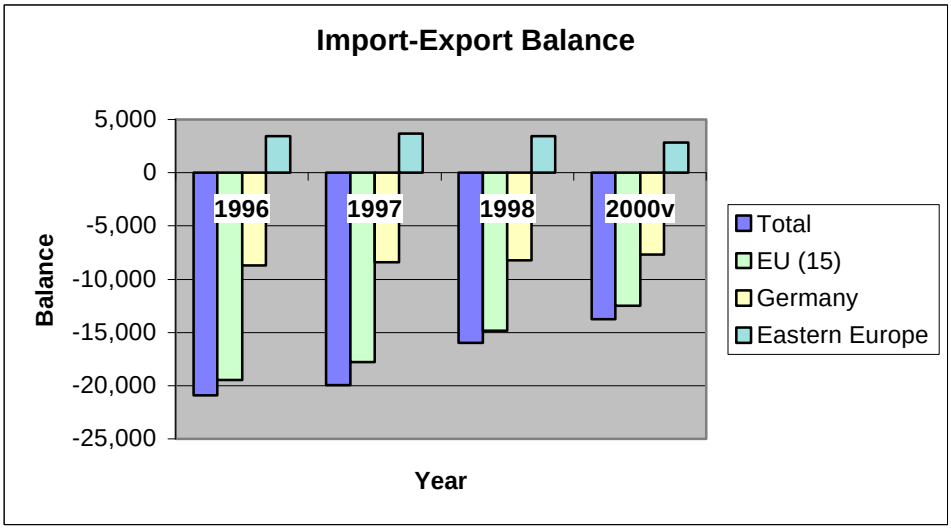
Problems with exports

Because of missing margins in the home markets Austrian food companies increasingly focus on exports. But in 2000 many problems made it very difficult for Austrian food manufacturers to achieve their goals. The main difficulties were: the Russian crisis, that especially influenced the export of sweets, the battle of hormones between the USA and the EU that reduced especially the export of fruit juices, the Belgian dioxin-scandal, the BSE crisis, and the reduction of the budget for export reimbursement as a consequence of the implementation of the GATT treaties. [20]

Despite these facts, the total import-export balance of the food industry improved during the last years. This improvement is mainly caused by a reduction in the negative balance with the 15 EU member countries which shows that Austrian products managed to become more competitive in Western Europe during the last several years. Negative is the fact that the balance with the Eastern European countries that had been positive decreased slightly.

[18] see Aiginger in: Buchinger, 1999, p. 23
[19] see Domschitz, 2000, p. 2
[20] see Domschitz, 2000, p. 2 f

Figure 2.2-2 Import-Export Balance: Austrian food industry 1996 – 2000 (Projection)

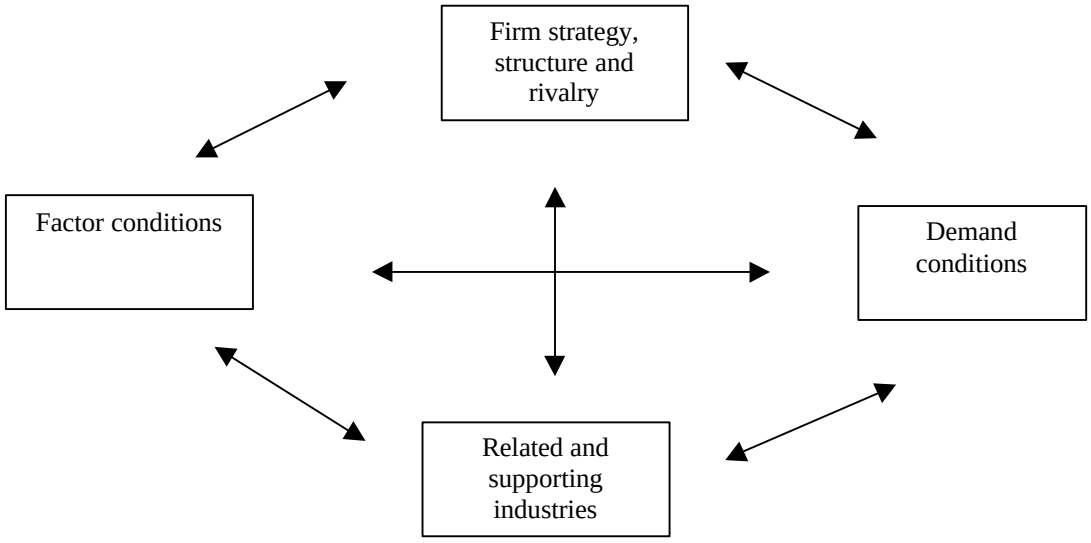


Source: Created by the author of this paper; Source of numbers: Chamber of Commerce, Austria

2.3 Analysis: Porter's diamond of national advantage

After having shown the most important trends in the Austrian food industry I would like to conclude this chapter with an analysis of the sector according to Porter's diamond of national advantage.

Figure 2.3-1: Porter's diamond of strategic advantage



Source: Porter, 1998, p. 167

The diamond shows the four main factors that determine if a certain industry can compete successfully in a country.[21] I would like to have a look at each of the factors, describe their current situation and how competence networks can contribute to their improvement. The results are based on a study by Hannes Weindlmayer in 1996. I include current changes in the factors: [22]

Factor conditions

The two main factors determining the situation of the industry are skilled labor and infrastructure. Concerning labor the main advantage of Austria is the good education system and the high availability of skilled labor. [23] Managers in the food industry in

[21] see Porter, 1998, p. 167 f
[22] see Weindlmayer in: Buchinger, 1999, p. 34 ff
[23] see Leo, 2001, p. 9

Austria are highly content with the education system. Negative factors for companies in Austria are the high personnel costs and the high social security contributions. [24]

Infrastructure is very well developed in Austria. The high energy costs that always constituted a severe problem for companies are going to decrease after the liberalization of the energy market that took place recently. The sector of telecommunication has achieved a strong increase due to the liberalization of the market, which reduced prices and offered new service providers and the modernization of network infrastructure. Austria is now one of the leading countries concerning market penetration with mobile phones. The use of internet is above average in the European Union. [25]

Firm strategy, structure and rivalry

Strategies are often too short-sighted. One of the main problems is the structure of the industry that is dominated by small and medium-sized companies. The big companies are often subsidies of international global players. The productivity is rather unfavorable and is going to improve very slowly. Negative is the fact that the industry was strongly protected from foreign competition before Austria became a member of the EU and that, hence, many innovations have come too late. Companies are mainly focusing on product imitation rather than on product innovation. This shows that Austria has not managed to transfer from a catching–up technology taker to a technology leader.[26]

The strategy of being a catching-up technology taker, which has been pursued successfully by Austrian companies for centuries, will have to change now as countries with cheaper labor successfully take over this role. As Austrian food industry often cannot compete on the level of prices, it has to compete with quality and new innovative products.

Demand conditions

Very positive is the positive image of Austrian food in Austria and nearby countries. That image could also survive the recent food scandals in the European union as

[24] see Tichy in: Handler, 1998, p. 60
[25] see Ministry for education, science and culture, 2001, p. 71 f
[26] see Leo, 2001, p. 5

Austrian products were not involved. Austrian consumers demand fresh food and the trend for organic food is increasing in Europe. This trend is very positive for Austria as a high amount of farms are organic farms.

Related and supporting industries

Positive is the good quality of the food in Austria but negative are the high costs of the products in Austria. These high costs are caused by the unfavorable structure of the agricultural sector that consists of many small farms and the negative conditions for the production of farm goods in many parts of Austria. In Austria, 68 % of all farms have to face unfavorable natural conditions, as compared to an average of 55% in the EU. Positive is the availability of good machinery suppliers.

2.4 Necessary changes in the industry

As the first pages of my work show the situation of the food industry in Austria is not easy and companies have to face several challenges. Some steps have to be taken in order to make the industry more competitive and help the companies to survive. The following list wants to show some of the most important changes.

Increasing participation in networks

Networking has to be increased in the industry. Increased networking has been a global trend during the last years. The reason is that with increasing global competition companies have to adapt rapidly to changing market conditions and have to take the lead in product innovation. This means a change from the Austrian tradition. Austrian food industry, like the Austrian industry in general, concentrates on continuing improvement of products and processes. This strategy has been successful for a long period of time but a change in policy seems to be necessary now. A stronger specialization is necessary to be able to compete successfully on world markets. This increased specialization increases the dependence of companies on complementary knowledge from other companies. The structure of the Austrian food industry, that consists mainly of SMEs, further enhances the importance of networking to compensate for the disadvantage of small size. [27] This networking has to take place on several levels:

- Alliances with the agricultural sector have to be improved. These alliances are especially important in the fields of quality management.

- Alliances between companies are necessary to compensate for the small size of the companies. This will increase the potential for innovation, increase the budgets for marketing and increase power in negotiations with the retail business.

- Vertical cooperation has to be increased as it enables companies to increase quality and reduce costs. Also retail will have to be included into these cooperations but its role should not be dominant.

- Stronger cooperation with research institutes and universities should help to increase the rate of product innovations.

Other useful steps

Besides increasing participation in networks, other steps can improve the competitiveness of the industry.

- Marketing activities have to be increased to use the positive image of Austrian food.

- The dependency on the retail industry should be reduced. Important steps to reach this goal are a stronger focus on exports and a stronger use of direct selling techniques. [28]

- Funds used for Research and Development have to increase. After the successful process of change of the Austrian industry, the strategy of being a technology-taker that was successfully used for many centuries cannot be used any more. [29] Companies should take advantage of special public support programs, for example funds of the FFF. [30]

- Benchmarking will have to play a more important role for the development of strategies.

- The mobility of professors between research institutes and companies has to be increased. One possibility is the creation of spin-offs. This has been successfully done by Prof. Pfannhauser in Graz. [31]

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[27] see Cimoli/Constantino in: Lopez/Martinez, 2000, p. 65
[28] see Weindlmayer in: Buchinger, 1999, p. 55
[29] see Tichy in: Handler, 1998, p. 107
[30] see Aiginger in: Buchinger, 1999, p. 25
[31] see Tichy in: Handler, 1998, p. 107

3 The role of cooperation in the food industry in Austria

The global developments as well as the developments in Austria show that the situation is difficult for food producers and that it will become even more difficult in the future. It will increasingly be impossible for companies to manage these problems alone. As the previous analysis of the sector has shown, strong alliances have to be created to increase the competitiveness of the sector. To compensate for the small size of the industry cooperations in many fields and the creation of strong competence networks will be necessary. Being a member of a strongly developed competence network will be one of the determining factors of success for individual firms as it means fast and easy access to information and allows the companies to specialize in their core competencies. [32]

3.1 Definition of a cooperation

The definition of cooperation has developed over time and many definitions of cooperation exist now. The definition that comes closest to the definition of cooperation in this work is the definition of Ruprecht-Däullary: „A cooperation between companies is the voluntary co-work of legally independent companies with the intention to reach a higher degree of achievement of objectives than with an individual proceeding.“ [33]

Despite the fact that the definition of Ruprecht-Däullary is rather broad it is necessary to define cooperation even broader for this work.

Cooperation is any type of interaction between at least two partners that includes the exchange of information that is relevant for the business under the condition that both partners enter into the cooperation voluntarily. The likelihood of cooperations depends on the individual nodes and on the network structure.

[32] see Bianchi, Miller, Bertini, 1997, p. 9
[33] Ruprecht-Däullary, 1994, p. 18

3.2 Types of cooperations

There are several possibilities how to divide cooperations into groups. I want to use the distinctive factors degree of formality and relation between the partners in the cooperation.

3.2.1 Division according to degree of formality

According to their degree of formality cooperations can be divided into formal and informal cooperations.

Formal cooperations

Formal cooperations are institutionalized and supported by contracts or other types of formal agreements.

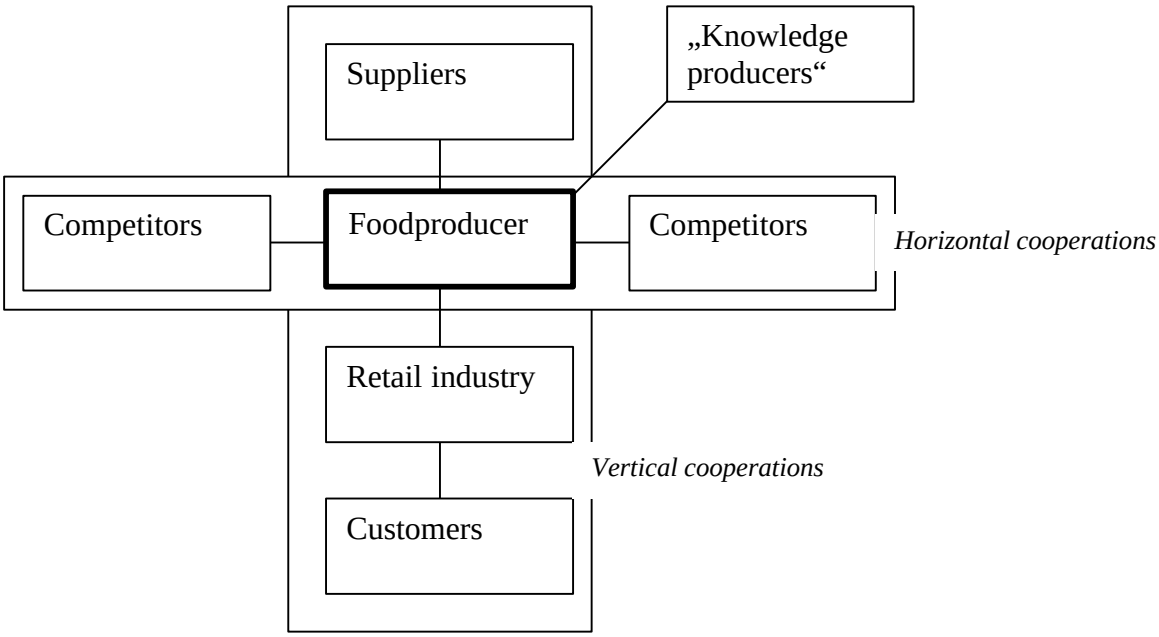
Informal cooperations

Informal cooperations take place without any formal agreement. The participants often do not even realize that they have entered into a form of cooperation. Nevertheless, this type of cooperation plays a very important role. Geographic proximity is often a necessary condition for this type of cooperation. The degree of informal cooperation depends strongly on the employees and their social network. It is very hard to detect and control informal cooperations.

3.2.2 Division according to relation between partners

According to the relation between partners cooperations can be divided into horizontal, vertical cooperations and cooperations with knowledge producing institutes and companies. The following graphic shows all the possible types of cooperations.

Figure 3.2-1 Types of cooperation



Source: Created by the author of the paper

Horizontal cooperations

Horizontal cooperations are cooperations among competitors in an industry. They are also called interindustry cooperations. Horizontal spillovers can be internalized by this type of cooperation.[34] Horizontal spillovers means that competitors can profit from innovations of other competitors without having to pay for them. Horizontal spillovers are types of positive external effects. If horizontal spillovers are low, competition leads to higher innovation than horizontal R&D cooperation. On the other hand, cooperation between competitors increases R&D when horizontal spillovers are high. The size of vertical spillovers also influences this framework but the effect is not clear yet and depends on the market structure. [35] Horizontal cooperations mainly suffer from mistrust between competitors.

Vertical cooperations

Vertical cooperations are cooperations between partners along the value adding production chain. [36] It represents cooperation with suppliers/distributors. Vertical cooperations are always interindustry cooperations. This type of cooperation is less

[34] see Atallah, 2000, p. 1
[35] see Atallah, 2000, p. 17 ff

likely to reduce competition and is hence less monitored by competition authorities. The reasons for vertical cooperations are spillovers between buyers and sellers. [37]. The effect of vertical cooperation is greatest when there is a high degree of interdependence among the relevant stages of production because unpredictable changes make it costly to specify contracts. [38] Vertical cooperations offer high potentials for increase of competitiveness and they do not have to face the troubles of competition As they are cooperations between different industries, different cultures and mindsets of the partners can create a severe obstacle. The main potential problems of vertical integration are the loss of efficiency benefits of competition and, especially when buyers or suppliers deal only with one partner, restricted flows of information to the decision makers. [39]

None of these two types of cooperation clearly dominates the other. Sellers usually prefer vertical cooperations whereas buyers usually prefer horizontal cooperations. The higher the spillovers the higher is the likelihood of cooperation. As the choice for cooperation and cooperation partners is influenced by a wide variety of factors the outcome of the process is uncertain. [40]

Cooperations with "knowledge producing institutes and companies"

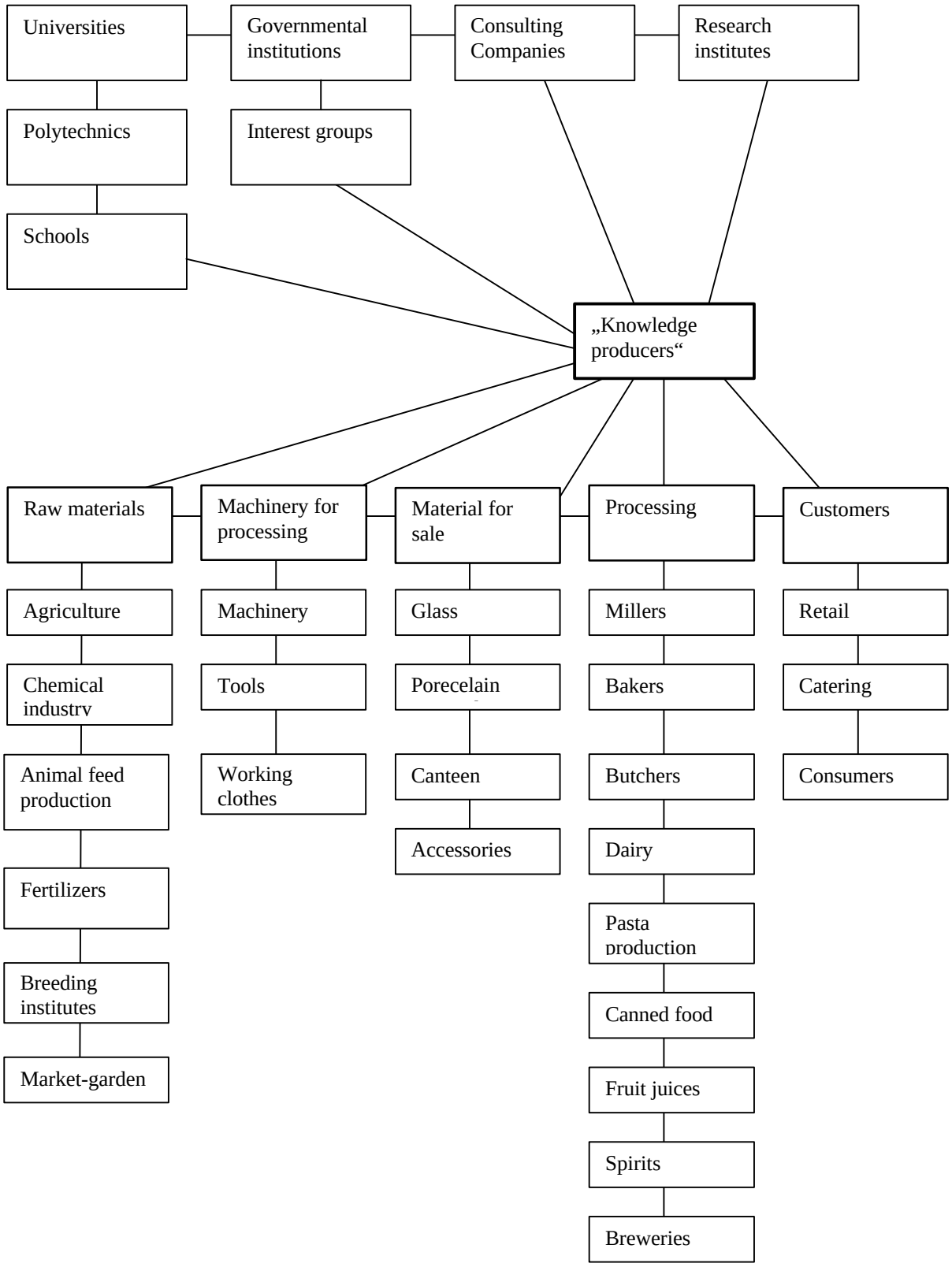
The main task of knowledge producing institutes and companies is the production of knowledge. These companies and institutes can provide expert knowledge and have the advantage that they cooperate with many different companies. Hence, they can collect lots of information and experience. Examples are: universities, polytechnics, schools, research institutes and consulting companies. This type of cooperations is underdeveloped in Austria and especially SMEs suffer from too few cooperations with knowledge providers.

[36] see Almquist, 1998, p. 16
[37] see Atallah, 2000, p. 1
[38] see Schibany, 1998, p. 22
[39] see Gerosky, 1992, in: Schibany, 1998, p. 23
[40] see Atallah, 2000, p. 3

3.3 Partners for cooperations

To determine the partners for cooperations, it is necessary to have a look at the structure of the industry and to determine the important participants. Food producers have to think about cooperations with suppliers, the retail industry, customers, competitors and knowledge producers. Knowledge producers are in this context all partners whose main task is the production of knowledge. The following graphic shows all these partners in more detail and creates a picture of the whole industry and all the links. All the potential partners and their relations to the food producers are explained in the next chapter.

Figure 3.3-1 Potential competence network in the food industry



Source: Created by the author of this paper, Parts taken from information brochure Foodcluster Upper Austria

According to Schibany the most important partners for companies in the Austrian industry are suppliers of materials and components (62%), followed by private customers (56%), suppliers of technical services, testing and control (42%), parent and subsidiary (39%), the government as a customer (33%), university and research centers (33%), competitors (20%), and, finally, marketing and management consultants (18%). The importance of universities and research centers has steadily grown during the last years.[41] I will continue with a description of each of the potential partners and his/her role in the food industry.

3.3.1 Suppliers

Suppliers play a very important role as channels of information in the food industry. Very important are the suppliers of machinery and the producers of spices.

Producers of machinery often initiate product and process innovations. In order to sell their new machines they have to make their customers aware of the new technology and its advantages. As they visit many different companies they get a good overview of problems of the individual companies. Together with their customers they develop new solutions for their problems and make their production processes more efficient.

Suppliers of spices and other ingredients play an important role as innovators of new products. They often do not just offer their product but combine it with the development of new products for their customers. Again the fact that they have good contacts with many companies makes them the first ones to realize problems and changing trends. By offering free training they also strongly influence the direction of the industry.

3.3.2 Retail industry

Retail industry plays a critical role for the food producers. As mentioned before, the high concentration in the retail industry gives it a lot of power. Cooperation, hence, is often strongly influenced by the retail companies and food producers often have to enter into these cooperations without their own wish to do so. The producers have to appeal to their wishes as end consumers can never buy a product as long as retail

[41] see Schibany, 1998 in: Schartinger, Gassler, Schibany, 2000, p. 11

stores don't sell it, except for ways of direct selling that are rarely used. On the other hand, the retail industry knows much about the consumers and their wishes and, hence, it is a valuable source of information.

3.3.3 Universities, polytechnics, and schools

One of the major shortcomings of the Austrian industry are the weak linkages between research carried out at universities and the business sector. Hence, the improvement of these linkages has been one of the main goals of the Austrian innovation policy. [42]

Food producers can cooperate with universities in many fields. The potential partners for cooperation are business universities and institutes dealing with food technology.
In Austria, public business universities are located in Vienna, Linz, Graz, Klagenfurt and Innsbruck.

Universities and institutes dealing with food technology are the following:
"University of Vienna: Institute of Nutritional Sciences, Vienna,
University of Agricultural Sciences: Dept. Of Dairy Research and Bacteriology, Vienna,
University of Agricultural Sciences: Dept. Of Food Technologies, Vienna,
Technical University of Graz, Dept. Of Biochemistry and Food Chemistry, Graz,
Technical University of Vienna, Dept. Of Food Chemistry and Food Technologies, Vienna,
Veterinary Medical University, Institute for Meat Hygiene, Meat Technology and Food Science, Vienna and
Veterinary Medical University, Institute of Milk Hygiene, Milk Technology and Food Science, Vienna."[43]
The list shows the strong concentration of the universities in Vienna.

Polytechnics have existed only for a couple of years in Austria. They were installed in 1994. Since this time they continuously rise in importance. [44] In comparison to universities, their approach is much more oriented towards practice and they seek out

[42] Leo, 2001, p. 15
[43] Richmond, 2002, p. 4
[44] see Schartinger, Gassler, Schibany, 2000, p. 4

cooperation much more actively. Their implementation and rapid growth has strengthened the links between the educational sector and local businesses. [45] There is currently no polytechnic for food technology in Austria but one is planned in Salzburg and a polytechnic for biotechnology in Linz will also focus on the food sector in the future.

HTLs are secondary schools with a focus on technology, engineering, etc. The qualification at these schools is higher than education in other secondary schools in Europe and degrees at these schools are sometimes seen as an equivalent to a university degree. [46] HTLs play a very important role in Austria, especially as partners for cooperation for SMEs that often employ their graduates. There is one HTL for meat technology in Lower Austria and one for crop technology in Upper Austria.

Research done by Schibany shows that there is a strong correlation between the size of a company and its cooperation with universities. Small companies are much more reluctant to cooperate with universities than bigger companies. The main reasons are the missing contacts as they have much less employees with university degrees and the increased difficulty of communication.[47]

The study shows that 32 % of the innovative firms in Austria did contract research with universities and 23 % did joint research. The most important way of knowledge exchange was the employment of graduates, followed by the support for masters and Ph.D. theses. [48]

Goals for cooperation with universities are in order of importance: “capacity for problem solving, expected learning process, access to state of the art science, cost reduction, access to additional research capacity, high quality of university research, outsourcing, access to research networks, and the building up new research areas”. [49] The study conducted by Schibany shows that the universities are seen as producers of good knowledge. Despite this fact, the amount of cooperations is still too low. The

[45] see Peneder, 1997, p. 21
[46] see Schneeberger in: Handler, 1998, p. 265
[47] see Schibany 1998, in: Schartinger, Gassler, Schibany, 2000, p. 14.
[48] see Schartinger, Gassler, Schibany, 2000, p. 15 f.
[49] Schartinger, Gassler, Schibany, 2000, p. 23

fact that about 97 per cent of the universities' research budget is financed by the public hand and only 2 per cent is financed by industry shows the weak linkage of Austria's higher education research with other sectors, in particular, with the business enterprise sector. [50]

Unfortunately, access to this knowledge is still hindered by many factors of which the main ones are the following:

Barriers to cooperation with universities

The following table shows the reasons why companies do not enter into cooperation with universities in Austria. 1 shows the highest importance and 5 the lowest importance. [51]

[50] see Hutschenreiter et al, 1999, p. 8
[51] see Metzler, Meusburger, 2001, p. 164

Figure 3.3-1 Barriers to cooperation with universities

	Importance				
Barrier	1	2	3	4	5
Lack of interest on behalf of the enterprise	36	48	61	31	23
Research capabilities of the institute are not known Outside the university	56	71	43	14	12
No spare capacities	58	47	48	25	25
Cooperation has no significant merit	14	45	59	41	32
Financing of the cooperation	39	48	41	40	20
Labor regulations hampering cooperation	6	11	27	56	89
Poor resources on the side of the institute	5	15	45	51	73
Different time horizons between university and Industry partners	19	42	52	42	38
Other	10	3	2		2

Source: Hutschenreiter et al, 1996, in: Metzler, Meusburger, 2001, p. 164

The main obstacle to cooperation is the fact that companies often do not know what kind of potential universities offer. The main obstacles from the side of the universities is the fact that professors are judged solely on the basis of their publications and that the projects with companies are assumed to have less value. The financial incentive of the cooperation loses its importance because the universities are not autonomous. The current reform of the universities will increase autonomy and should enhance cooperations.

In addition, the K-ind, K-net and K-plus projects were determined to reduce obstacles for cooperation between universities and companies. [52] FOODNET Salzburg, one of the five competence networks that I will describe later, wants to

[52] see Leo, 2001, p. 16

become part of the K-net project. I will further describe this program in the section about FOODNET Salzburg.

Another initiative that should reduce obstacles for cooperation between industry and universities is the Technology network of the LVA, the main food research institute in Austria.

3.3.4 Research institutes

There is one private research center for food, the LVA ”Lebensmittelversuchsanstalt“ in Vienna and eight public research institutes: two in Vienna, one in Upper Austria, Styria, Salzburg, Tyrol, Vorarlberg, and Carinthia. The research centers that do not belong to universities are not supported strongly enough by the government. They receive only 11% of their expenses from public funds in comparison to 28 % on average in the EU. [53] The LVA currently is developing a competence network. Its aim is to function as a link between the different networks.

3.3.5 Competitors

Competitors are important potential partners for cooperation. Companies are remarkably well informed about their competitors in Austria and even in industries such as the food industry that consists of mainly SMEs, companies know most of their competitors either directly or indirectly. They are all organized in the food section of the Chamber of Commerce. Most of them share a common background and the probability that they have participated in a cooperation on local, regional or national level is very high. Despite the fact that cooperation on the macro level is high, cooperations between individual firms have been rather rare for a long time. Despite the fact that cooperation with competitors offers very high potential gains, companies often think that the risk of sharing information is too high to participate in this type of cooperation.

3.3.6 Consulting companies

The services of consulting companies are often too expensive for SMEs. In addition, food is often not a very interesting topic for consulting companies. Marketing

[53] see Handler, 1998, p. 110

consultants, for example, are on average, not very interested in dealing with the topic of meat.

3.3.7 Public institutions

Public institutions play an important role in Austria as they often initiate the creation of a competence network that promotes cooperation. They also support cooperation by offering consulting services and information.

A very important role of public institutions is one as a provider of financial support. The support of food technologies, food control, food production and consumer needs is divided between several ministries in Austria. Involved in these areas are the :
"Federal Chancellery, Directorate VI nutrition and health,
Federal Ministry of Science and Transport research policy principles,
Federal Ministry of Agriculture and Forestry quality of agricultural production,
Federal Ministry of Economic Affairs enhanced competitiveness of SME, and the
Federal Ministry of Labor, Health and Social Affairs human health and socio-economic aspects." [54]

As food producers are, besides a few multinationals that are represented in Austria, mainly SMEs public policy focuses strongly on increasing the competitiveness of SMEs.

R&D is financed by different government departments that fund strategic applied research on an individual project basis. In addition, research in the field of food is funded by two funds, the Austrian Industrial Research Promotion Fund (FFF) and the Austrian Research Fund. The FFF supported the food sector with 160 Mio ATS for a special research program in the food area ("Lebensmittelinitiative Österreich") for two years. This fund has recently been prolonged for another two years. This program aims at supporting cooperation between industry and research institutes, cooperations between enterprises, and joint projects with international partners. The second fund is the Austrian Research Fund that supports basic research with an annual budget of 835 Mio ATS. [55]

[54] Richmond, 2002, p. 1

Informing the partners about these funds and helping them to get access to the funds is one of the main tasks of the competence networks.

Considering public institutions, the role of employers' and employees' representatives is very important. A special feature in Austria is the social partnership. This cooperation is an important institutional factor and enhances a genuinely Austrian form of "corporatism". The social partnership is thus a complex set of institutions based on voluntary co-operation between the employers' and employees' representatives and extending over all major fields of economic policy and beyond. [56] The different industry sections of these institutions have very good contacts with the companies of the sector and provide them with information, education, and financial support.

[55] see Richmond, 2002, p. 3
[56] see Bellak, 2001, p. 10

3.4 Cooperations creating competence networks

The term competence network has many definitions. The definition that I will use in the following work uses the syntax of network economics.

A competence network consists, as any network, of nodes and links. The nodes are all kinds of institutes that produce or store information, for example, individual firms, universities, research institutes, schools or public institutions. The links are the ways through which information is exchanged. [57] As long as no information flows, the links are only potential links. Each link is associated with some costs that are incurred with using this link. As soon as the first exchange of information takes place the potential link becomes a link and costs of using this link are significantly reduced. Each further exchange of information strengthens the link which means that it reduces the costs of the link and increases its likelihood of being used.

The only form of information exchange that I would like to describe is the one which happens in the form of cooperation which means that the exchange of information takes place voluntarily and that it offers some benefits or potential future benefits to both partners.

Links are not considered to be links as long as no information has been exchanged through them. Hence, cooperations are the only way through which networks can be created and developed. The probability of these cooperations strongly depends on the potential links. This means that an improvement of the network can be achieved either by directly supporting cooperations or by improving the network structure. Improving the network structure means reducing the costs on the links and potential links.

As mentioned above, cooperations are the only ways in which competence networks are created and improved. At the same time the goal of networks is to enable and support cooperations. Before focusing on competence networks I will describe the potential advantages of and obstacles to cooperation in the Austrian food sector.

[57] see Kobayashi in: Batten, 1995, p. 132

3.5 Potential advantages of cooperations in the food industry

According to Dunning the main reasons for the creation of alliances are: "potential increases in access to new and complementary technology, the economics of synergy, the economics of interdependent activities, the possibility of distributing risks, the promotion of joint R&D efforts with suppliers and users as a defensive strategy to reduce competition, reciprocal benefits from the combined use of complementary assets and knowledge, accelerating the learning process, reducing transaction costs and overcoming (or creating) entry barriers". [58]

In the following part I would like to separate cooperation into two types, cooperations solely composed of information exchange and other cooperations.

3.5.1 Advantages of information exchange

The exchange of information offers high potential benefits to all participating partners.

3.5.1.1 Economies of scale

As mentioned before, the main avenue for cooperation is the exchange of information. [59]

In the following work I will regard information as a nonrival partially excludable good. This assumption makes sense as the costs incurred for the creation of information only has to be paid once. The costs do not increase if the information is used by several partners. [60] The only costs incurred are trust costs for the company that takes the first step in a cooperation. Such costs occur because companies have to provide some information in a cooperation and they cannot be sure that they will get something back later. As the costs for creating information only occurs once, economies of scale can be achieved if several partners use the same information.

[58] see Dunning, 1997, in: López-Martinez/Piccaluga, 2000, p. 65
[59] see OECD, 1999, p. 383
[60] see Kobayashi in: Batten, 1995, p. 134

3.5.1.2 More channels for learning and creating expertise

According to Porter possible strategies of cooperation to achieve competitive advantage are cost reduction and differentiation. [61] New information can lead to reduction in production costs and is necessary for the creation of new products. [62] Information can be created in-house, but this demands high expenses for R&D and good experts. Cooperation offers a second possibility for achieving new knowledge. Besides creating the information in the company it can also be achieved by looking at others, this means a combination of the individual learning curves of separate firms. [63] Combined knowledge will mostly lead to better results than if only one person tries to solve a problem. In many cases it will not just improve the result but will be a necessary condition for innovation.

Innovation can be divided into product innovation, process innovation, incremental and radical innovation. As a survey in 1994-1996 on 435 firms for the West Midlands project suggests, each of these four types of innovation has its own influencing factors. The role of inter-firm cooperation is different in the four types of innovation, as well as the relative importance of external and internal innovation inputs. The four types have in common that they all depend on the innovative milieu of the industry. This innovative milieu increases if there exists a well developed production network of localized industries. [64]

This observation goes along with the idea of the innovative milieu model of Camagni, 1991, which is one of the main models of systemic innovation. According to this model, the innovative capacity of a milieu is determined by geographic proximity, informal relationships between firms and a collective learning process. [65] This model stresses the importance of well developed competence networks.

3.5.1.3 Economies of scope

During the last years production processes have become longer and more difficult. Life cycles of products shorten.[66] Products become more sophisticated, consumers

[61] see Porter, 1986, p. 164 f
[62] see Kobayashi in: Batten, 1995, p. 134
[63] see OECD, 1999, p. 383
[64] see De Propris, p. 15
[65] see Camagni, 1991, in: De Propris, p. 15
[66] see Bender, 2000, p. 7

more informed and laws more severe. While good knowledge in one field some years ago enabled companies to create outstanding products, this is not sufficient any more. It is hardly possible now for companies, especially small and medium-sized ones, to employ some experts in all these fields and to keep them at track. Hence, cooperation is the only way to create successful product innovations. The necessity of cooperation has been further enhanced by the increasing specialization of employees. In order to be successful, SMEs have to focus on their core competencies, specialize in a field and cooperate with others that have complementary abilities. "Core competencies are critical processes which have a high correlation with the well-being of the "stakeholders" and which can be better fulfilled by the company than by its competitors or other companies (best practice)."[67]

3.5.2 Additional advantages

Besides advantages that the exchange of information offers, cooperation offers high potential benefits in other fields. I will now discuss these in further detail.

3.5.2.1 Joint purchasing

Networks aimed at joint purchasing have three advantages. Firstly, these networks increase the purchasing power for the individual firms which enables them to negotiate for lower prices. Secondly, they help the companies to reduce costs as they can reduce personnel in the purchasing department. Thirdly, they make the companies become a more attractive partner for the sellers as they demand a more comprehensive bundle of goods. Hence, sellers don't have to deal with several buyers but can cooperate with one or two partners.

3.5.2.2 Synergies

Some of the competence networks that will be described in this paper achieve synergies by sharing the use of facilities and the common stocks of replacement parts. Replacement parts used by several firms that have to be on stock because of their importance for the production cycle now only have to be stored once instead of storing them separately for each firm.

[67] Hinterhuber, 1996, p. 13

3.6 Impediments to cooperations

Although cooperations offer high potential gains, companies are, nevertheless, reluctant to enter into these cooperations. The reason are different obstacles that are subsumed under the term “costs” in competence networks. Cooperation is useful in the case that the costs are below the improvements, either of costs or differentiation, that the exchange of know-how contributes. [68] As mentioned earlier, these costs are especially high on the potential links before the first cooperation takes place.

I separate now these costs into three groups, costs that are especially relevant at the beginning of a cooperation, costs that depend mainly on the network structure, and costs that depend on the nodes of the network.

3.6.1 Costs for starting a cooperation

The decision process of the individual companies if they should participate in a cooperation or not can be observed in accordance with game theory. [69] The principle of game theory is that companies choose their optimal strategy, assuming that there competitors choose their optimal strategy, as well. Sometimes this will not lead to the best result for all of them and this is the situation when the government can improve the situation for all by lowering the limits to cooperation, which means reducing the costs on the links in the competence networks.

3.6.1.1 Uncertainty about the partners

As mentioned above, costs on potential links are much higher than costs on links after the first interactions have taken place. One of the main reasons for this observation is that the highest costs at the beginning of a cooperation are caused by the uncertainty surrounding the partners in the network. Trust cannot be created at once but has to evolve over time. As it evolves, the cost of uncertainty decreases.

Trust is especially important in horizontal cooperations. Entering into a cooperation means that the company will have to share information with its competitors. This is only beneficial if the company trusts that it will receive equal information in

[68] see Porter, 1986, p. 444 f
[69] see Nagurney, 1999, p. 263

exchange. Hence, the potential losses for the one taking the first steps are high. Often the result of this decision process is that none of them initiates a cooperation although both could profit.

This decision is strongly influenced by the past experiences and the mindset of the manager in charge of this decision. As the concept of cooperation is fairly new in Austria, the reluctance of older managers who were used to compete on their own, is quite high. The success of the cooperations that have been installed so far start changing the managers` mindsets and make cooperation a feasible alternative. Hence, these costs have generally been reduced on many links in Austria during the last several years.

3.6.1.2 Financial resources needed

The second problem is that finding partners for cooperation requires financial resources. These search costs depend strongly on the network structure. Additional financial resources are needed for the standardization of information systems of all the participating companies. In order to make cooperation efficient it is inevitable that the information systems of the participating companies are standardized. Furthermore, personnel costs are incurred as managers have to invest a significant amount of time into the development of the cooperation. [70]

3.6.2 Costs that depend on the network structure

As mentioned above, cooperations require a certain level of information exchange. There are several problems making this information exchange difficult or even impossible.

I would like to follow the notion of network economics in observing the exchange of information in networks. According to this theory, there are two different kinds of networks connecting the companies and enabling them to exchange information. [71] I would like to describe both and to state their unique problems.

As the theory states, the frequency of knowledge exchange among knowledge workers depends partly on firm's knowledge resources and partly on their knowledge

[70] see Kobayashi in: Batten, 1995, p. 132

accessibility both on telecommunication and transportation networks. This knowledge accessibility is determined by different factors in the two networks: [72]

3.6.2.1 High-speed transportation networks

High-speed transportation networks enable individuals to have face-to-face contacts in order to exchange information between companies, universities, and research institutes.

Despite the fact, that the technological possibilities have improved, face-to-face contact is still the most important way of knowledge exchange. Especially when the information becomes more complicated, people prefer face-to face contact to contact via telecommunication.

Distance

Because of the importance of this personal contact, distance between the players in the cooperation plays the most important obstacle to knowledge exchange in this network. The geographical concentration of the networks observed in this paper supports the importance of distance as a hindering element of cooperation. It is an indicator of the high importance of face-to-face contacts.

3.6.2.2 Telecommunication networks

Telecommunication networks are increasingly used for the exchange of uncomplicated information.

Missing network technology

The main determinant of the success of cooperation is the network technology. Its importance is supported by the work of Kobayashi who shows that an improvement of the network technology will increase the R&D intensity in the regional market and make it, hence, more profitable. Austria has concerning communication technology in many fields lower user rates than other developed industry nations but the growth rates were very high in some fields, especially the use of mobile phones.[73] In Austria, the food industry is the sector with the lowest amount of companies using the

[71] see Kobayashi in: Batten, 1995, p. 132 f
[72] see Kobayashi in: Batten, 1995, p.132 f
[73] see Ministry for education, science and culture, 2001, p. 71

internet. Especially small companies were for a long time rather reluctant to use this technology but now its use is spreading rather fast.

3.6.3 Costs that depend on the nodes in the network

The following costs that impede cooperations depend on the nodes in the network.

3.6.3.1 Missing skills of managers

The skills of managers are a distinct estimator of the success of a cooperation. Firstly, a positive mental attitude of managers is crucial. If they do not strongly support the cooperation personally and if they are not willing to invest financial and personal resources, a cooperation cannot work. The will to cooperate seems to change with time and right now the will for cooperation is very high in the Austrian food industry, as the strongly increasing number of cooperations shows. Besides the will to cooperate, experience and the knowledge how to deal with dynamics and complexity are necessary to handle the difficulties of a cooperation. Many of the networks provide some help to their participating partners in starting the cooperations.

3.6.3.2 Group dynamic and organizational challenges

In addition, a cooperation has to face group dynamic and organizational challenges. Especially at the beginning, managers often try to distinguish and are more concerned about their own position than the development of the cooperation. [74] This tendency is enhanced by the great echo of media that the installation of cooperation has evoked. Especially when the first cooperations in Austria were created the media echo was overwhelming. On the one hand, this media echo helped to spread the idea of cooperation and, hence, supported the stronger evolution of networks in Austria but, on the other hand, it posed the potential risk of making managers focus too much on their own personal benefit.

3.6.3.3 Partners in different phases of development

Cooperation is very difficult if the participating companies are in different phases of development. Companies in different phases have different experiences, cultures, structures, and mindsets. These differences can create problems especially between

[74] see Maitz in: Clement, 2001, p. 6 f

dynamic young and large and functionally developed companies. [75] As mentioned above, the food producers in Austria mainly share a common mindset and, hence, this problem is not that significant.

3.6.3.4 Fear of change

People usually avoid changes. They are especially afraid of changes in their working place. The reasons are on the one hand fear to lose the used safety and to be in a situation of uncertainty. Reasons are on the other hand the fear that the personal situation will become worse. People are, for example, afraid to lose competencies and prestige when the working place is reorganized. [76] As cooperation usually causes some changes employees often do not like cooperation.

[75] see Maitz in: Clement, 2001, p. 6
[76] see Steinmann/Schreyögg, 1999, p. 442

4 Description of five competence networks

Each company, each institute, in fact each employee in the industry has his own competence network which consists of all the partners with which he exchanges information and the links between them. These networks are very dynamic and change rapidly. Hence, it is very difficult or even impossible to picture them all, especially, because most of the networks are created through informal cooperation. This paper focuses on five formal competence networks that have been created in the last couple of years and that are distinct because of their size or the intensity of their cooperations.

The five networks are all very different in their goals, their challenges and their benefits. All of them exist only for a short period of time. The earliest one was created in 1998. As the latest data available is from 2000, a quantitative analysis of the effects of the networks is not possible.

As the strategies for cooperation, the structure and the size of the networks are very different, I decided that the best way to describe the networks is the use of case studies.

The information for these description was collected in interviews with the cluster managers:

- Foodcluster OÖ: Interview with the cluster manager Mag. Birgit Stadlbauer
- Austrian Food Cluster: Interview with Dr. Moritz, from the Chamber of Commerce, because the cluster manager Miss Elisabeth Pohl did not have enough time for an interview
- Foodcluster Southern Austria: Interview with the cluster manager Mr. Brunner
- FOODNET Salzburg: Interview with five members of the executive committee of the network: Heinz Joeris - WIBERG GmbH, Gabriele Markus - WIBERG GmbH, Wilfried Rogler - Salzburger Schokolade- und Süßwarenfabrik GmbH & Co KG, Rupert Schlager - Stieglbrauerei zu Salzburg GmbH, and Hans Steiner - Alpenmilch Salzburg Ges.m.b.H
- Competence network LVA: Interview with the cluster manager DI Bernhard Redl

In addition, I used documents that were provided by the cluster managers: information brochures, project plans, information emails and, if available, external information. The use of external material is always marked by a footnote.

The homepages of the individual networks were also useful sources of information:
Foodcluster Upper Austria: http://www.lebensmittel-cluster.at
Austrian Foodcluster: http://www.foodcluster.at/foodcluster/
Foodcluster Southern Austria: http://www.teigtaschen.at/fagola/start-cluster.html
FOODNET Salzburg: www.foodnet.at
Technology network of the LVA: www.lebensmitteltechnologie.info

As this information was mainly collected in interviews and from documents provided by the cluster managers, the description of the individual clusters strongly reflects the opinions of the individual cluster managers.

This work has three main goals:

- Firstly, the goal is to provide companies in the food industry that are interested in networking with information about the different initiatives and help them to chose the most appropriate network.
- Secondly, the experience that cluster managers shared in their interviews should support other companies in different industries interested in starting a network.
- Thirdly, this work should be an interesting source of information for the clusters themselves. It will be interesting to have a look at this work again in a couple of years and to compare the goals and strategies of the networks now with their future strategies for cooperation.

4.1 Definition of a competence network

As described above, a competence network consists, as any network, of nodes and links. The nodes are all kinds of institutes that produce or store information, for example, individual firms, universities, research institutes, schools or public institutions. The links are the ways through which information is exchanged. [77] As long as no information flows, the links are only potential links. Each link is associated with some costs that are incurred with using this link. As soon as the first exchange of information takes place the potential link becomes a link and costs of using this link are significantly reduced. Each further exchange of information strengthens the link which means that it reduces the costs of the link and increases its likelihood of being used.

As this definition is very open, a competence network is a term that includes many phenomena that can be observed in the food industry right now. Phenomena that can be subsumed under the term competence network range from: “tight contractual arranged co-operative efforts as 1) joint venture and research cooperations or 2) joint R&D agreements to 3) the contractual arranged exchange of R&D results, from financial engagement as 4) direct investment to 5) licensing of technology and 6) subcontracting form common established 7) research associations, 8) participating government sponsored programs or 9) the building up of a common R&D infrastructure like data-banks etc to 10) the informal exchange of know-how between firms in a network or the employed scientist and engineers.[78]

[77] see Kobayashi in: Batten, 1995, p. 132
[78] see Freeman, 1991, in: Pyka, 1999, p. 17 f

4.2 Cluster as the prevailing type of network

I would like to start my description of the networks with the three networks that call themselves clusters.

4.2.1 Cluster versus competence network

A cluster is a special type of a network that is characterized by geographic proximity of the participants. As three of the five networks call themselves "cluster" I would like to shortly describe the concept of a cluster and why I believe that the term competence network is more appropriate.

A cluster is according to Porter:
„Geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions (for example, universities, standards agencies, and trade associations) in particular fields that compete but also cooperate."[79]

The words cluster and networks are often used as substitutes. I prefer the word "networks" in this context.

The first reason for this decision is that, in my view, the word "cluster" is misused in the context of the Austrian food cluster and the food cluster Southern Austrian as the networking with other industries is not developed enough. Perhaps they are on the way of becoming a cluster but they certainly have not reached this goal yet. Observing the current status, I would rather call them "export cooperations".

Cluster as a special type of network is characterized by geographic concentration and seclusiveness. This local focus exists in the described networks now but it is going to vanish in the near future, as tendencies can be observed in the clusters to expand their sphere of action to other countries. The clusters also start to link up with each other and start exchanging information with companies and institutes in other countries. In my view, this tendency is correct as Austria is too small to handle several clusters in the food industry. Hence, the word "competence networks" that

[79] Porter, 1998, p. 78

implies geographical openness seems to be much more appropriate to describe the phenomena observed.

Despite the problems of the use of the word cluster with the three competence networks that I will describe in the following chapter, one has to face the fact that these networks call themselves cluster and that government treats them like clusters. Hence, I will use the word cluster in the following part where I describe government policy that supported these networks.

4.2.2 Cluster policy in Austria

Government and government programs played an important role for the evolution of the competence networks that I will describe. In order to understand the evolution of the individual clusters it is necessary to have a look at the Austrian government policy concerning clusters.

The cluster concept has high priority in Austrian policy. The creation of clusters is generally accepted as an instrument to improve the competitiveness of the Austrian industry. [80]

The first institutionalized cluster in Austria was the Car-cluster in Styria created in 1996. After the success of this cluster, many more clusters have been created. [81]

4.2.2.1 The general concept for the development of clusters in Austria

Since 1996 many clusters have been installed in Austria. Their development followed a common approach [82]:

Initiative and financial support by a public authority

The initiative for the creation of clusters mainly comes from the government or a regional authority. To support their evolvement all the clusters are at the beginning financially supported by the country or the federal state. This financial support is justified by the positive external effects of the cluster.

[80] see Leo, 2001, p. 11
[81] see Zakarias et al, 2001, p. 6
[82] see Clement, 2001, p. 2

Achievement of financial independence

After this first initial phase, the cluster is supposed to achieve financial independence. The duration of the financial support depends on the program. It plays a crucial role for the success of the cluster. As the example of the Austrian food cluster shows financial support that is given for a too short period of time can lead to severe problems with the financing of the cluster. Possible sources of revenues for the clusters that have to pay there own expenses are: the sale of services, promotion fees, advertising, and sponsoring.

Achievement of legal independence

The next step would be legal independence. In all of Europe only the car cluster in Styria has achieved this goal so far.

4.2.3 Types of clusters in Austria

In Austria, three different types of clusters have been developed. [83] Each type of cluster contains also one food cluster:

Regional Clusters

The regional clusters have a strong regional focus. They are created and financed by the state government. Upper Austria plays a leading role in the installation of this type of cluster. The Foodcluster Upper Austria belongs to this type of cluster.

Austrian Clusters

Austrian Clusters are installed and financed by the government. One very important initiative in this field is the „Export initiative“. This program initiated the installation of the Foodcluster Austria and the Foodcluster Southern Austria.

Competence Centers (K-plus, K-ind, K-net)

The aim of the competence center initiative is to increase cooperation between universities and companies. They should create and support internationally competitive technology clusters. [84] FOODNET Salzburg that started as a privately initiated cooperation between five companies from Salzburg is going to participate in this program.

[83] see Clement, 2001, p. 1

After having shortly described the public programs that lead to the installation of the clusters, I will continue with a description of the three networks that call themselves cluster.

[84] see Hutschenreiter et al, 2000, p. 219

4.3 Foodcluster Upper Austria

The Foodcluster Upper Austria is a network of food producing companies, their direct and indirect suppliers, R&D, and qualification institutes.

4.3.1 Initiative and public support

Upper Austria is the leading region in Austria and even in the European Union concerning the development of clusters. Since 1998, seven clusters have been created in Upper Austria and two new clusters are currently under construction. Around 1.200 companies with 160.000 employees and a turnover of 160 billion Euros are currently members of the first six installed clusters. Due to cooperation, 156 product, process and market innovations have been created in these clusters during the last four years. With a contribution of 5,5 million Euros projects with a volume of 24 million Euros have been initiated. [85]

The Foodcluster Upper Austria was installed in September 2000. The installment was strongly influenced by the program 2000 + of the Upper Austrian federal government. This program should create stable conditions and determine the general framework for the technology politics of the Upper Austrian federal government. The goal of this program was to determine in which fields the Upper Austrian industry had its main competitive advantages considering the number of companies and the turnover of the industry. As the food industry is one of the main industries in Upper Austria and offers a high potential of successful innovation but as its development is also threatened by several factors, it has been chosen as one of the industries that should be supported with the installment of a cluster. The duty of installing this cluster was given to the WIFI.[86] WIFI is the Austrian Chamber of Commerce's Institute of Business Promotion. It is the top training and further education institute in Austria with a market share of 20 percent. It has an extensive national network of institutes with at least one main WIFI in each province and 80 branches which all offer WIFI courses. [87]

[85] see Fill, 2002, p. 3
[86] see www.clusterland.at
[87] see www.wifi.at

This was a change in policy from the method used so far as the technology and marketing agency had been the organization that installed all other clusters. The main reasons were the good contacts that the WIFI had with important participants in the food industry. Another important advantage of the WIFI is that it can also offer additional services, mainly advanced training, to the participating companies. In addition, it has good contacts with the Chamber of Commerce. These contacts are essential for companies in order to gain information about special programs that offer financial support for certain projects.[88]

The cluster activities are mainly financed by the division industry of the Upper Austrian federal government and the agricultural resort of the Chamber of Commerce.

The first steps to install the cluster were talks with the main stakeholders and with the leading companies of the region. They had to be convinced first to make the program run.

4.3.2 Main stakeholders

The main stakeholders are the agricultural sector as its products offer the basis for the food industry, the federal government of Upper Austria, the technology agent Beier, and the social partners. Very strong relations with the sections corn and meat exist.

4.3.3 Partners in the cluster

The cluster currently has 240 partners. The participants are not only food producers but also research institutes, two universities, an HTL, a bank, public institutions, and "Interessensvertretungen". This network uses the full scope of potential partners that have been described in the previous part. The HTL, universities, and research institutes guarantee access to state of the art research. Member companies will be informed about knowledge availability in these institutions. Therefore, reluctance to enter into cooperations with these partners will be reduced. The membership of a bank is also important as the lack of access to financial resources has been one of the main problems of cooperations in the past. In addition the bank provides information

[88] see www.wifi.at

about support programs of public institutions. The role of the interest groups is very important in Austria. They have good contacts to the industry and also to government institutions. Hence they are the main transmitters of information between these two groups.

4.3.4 Expectations of the partners in the cluster

Last year, Technopolis conducted a study about the success of the Upper Austrian clusters. According to this study 71 % of the participating companies improved their competitiveness during the last four years. The partners had different goals. The expectations of the participating companies are in order of their priority: [89]

- Contacts to new clients
- Improved access to financial public support
- Benchmarking
- Collecting experience with cooperation projects
- Product development
- Improved education level
- Improved marketing
- Contacts to specialists and consultants
- Contacts to new suppliers
- Improvement of culture of innovation

This list shows that cooperation projects were only in fourth place. More important was the contact to new clients, improved access to financial public support and benchmarking.

According to this study, around one third of the participating companies had already achieved their goals and 60 % was quite sure to achieve them in the next couple of years. Only 10 % of the companies were pessimistic about the development of the cluster. The results of all the clusters were strongly similar and hence the results also apply to the Foodcluster Upper Austria. The problem with this evaluation is that it was conducted just a very short time after the installation of the cluster and, hence, the results show rather expectations than real experience.

[89] see Fill, 2002, p. 7

4.3.5 Duties of the cluster management

The main duty of the cluster management is to reduce the costs for cooperation and, hence, to make cooperations more likely. The cluster management initiates and supports cooperation between companies, research institutes, and institutes for qualification.

To support these cooperations and to establish new ones, management provides the partners with information and simplifies access to financial support.

4.3.5.1 Information and communication

Information and communication is one of the main tasks of the cluster management. The following methods are used as vehicles for the improvement of cooperation:

Partner bourse

Management builds and maintains a partner bourse. All the participating companies are obliged to provide information about their company, their main competencies and fields of research. The management collects all this data in a data bank. If one of the partners is looking for a partner for a certain projects he tells the management about his wish. The management searches for potential partners in the data bank and informs him about potential partners that have competencies in the required field. After the partners have found each other the management helps them to get the projects started. The cluster managers function as moderators and aid the partners with writing a project plan for the project.

Information meetings

The management organizes information meetings. There are two classes of partners in the network. One class are members that are not so strongly involved in the cluster. They only use the services offered. The second group of partners are partners that are members of the research and development platform. They are strongly involved in the development of the cluster and contribute a distinct amount of time and information to forward the activities of the cluster. Several subgroups are formed in the cluster. These subgroups meet regularly to work on several projects.

Company visits

The cluster organizes company visits. The companies like to use this possibility to see other companies and it is a good possibility to improve contacts between the partners.

Information brochures, presentation of the cluster in the internet and PR

The members are informed every month per email about the status of the cluster, activities and education programs. Four times a year printed reports about the activities of the cluster are published.

4.3.5.2 Financial support

In the context of the cluster, innovative cooperation projects are financially supported. In order to get some public funding some rules have to be observed. At least three partners of the cluster have to participate in the cooperation and at least one of them has to be a SME. Projects in the field of R&D, production, marketing and sales, logistics, organization and information technology, qualification and internationalization are supported. Up to 40 % of the expenses are reimbursed, The maximum amount is 37.500 Euros for each partner. In addition to supplying the partners with funds from the cluster, the cluster management also helps the partners to attain funds from other support programs

Besides the increase of cooperations, the cluster management supports its partners in the fields of marketing, internationalization and qualification.

4.3.5.3 Marketing

Cluster management supports the creation of sales programs, provides information material, does PR for the cluster, its partners and the Upper Austrian food industry and participates in national exhibitions.

4.3.5.4 Internationalization

The managers analyze the potential for foreign markets, visit and participate in international exhibitions, and organize common product presentations in foreign countries.

4.3.5.5 Qualification

The managers analyze the necessity of qualification and develop education and advanced education programs.

4.3.6 Types of cooperations

Due to the activities of the cluster there are currently 80 partners of the 240 partners involved in one or more cooperations. The following types of cooperation exist:

4.3.6.1 Vertical cooperations

Most of these projects are along the value chain. The importance of vertical cooperations is very high. On the one hand, vertical cooperations can often be installed much more easily than horizontal cooperations as they do not involve direct competitors. Hence, the fear of the participants to share information is lower. On the other hand, horizontal cooperations alone only offer a limited amount of synergies that can be used and the main potential for improvement lies in a better alignment of the whole value chain.

4.3.6.2 Cooperations with research institutes

The improvement of cooperation between business and science is one of the main goals of the cluster. Despite the fact that there is no university in the food sector in Upper Austria this goal could be successfully achieved. Cooperations involving the universities in Vienna and Graz have started. A research institute is involved in every second project that has been installed during the last couple of years. As mentioned above, no polytechnic for food technology exists in Austria. Upper Austria does not plan to install a polytechnic for food processing but the existing polytechnic for biotechnology and environmental technology will strongly focus on this topic in the future.

4.3.6.3 Horizontal cooperations

Horizontal cooperations between different food producers are also important. In this type of cooperation competitors can be involved. The different companies act differently to this fact. Some leave the network as soon as a competitor becomes a member, others accept this fact and in some cases even cooperation between direct competitors is possible. This type of cooperation happens often in export

cooperations but also sometimes in other fields. One example is the cooperation of different bakers that create a new line of products made only from organic ingredients.

4.3.7 Fields of cooperations

The main focus of the cluster lies in cooperationa in the field of common R&D. The cluster management strongly supports this type of cooperation. Process innovations could improve supply chain management and quality management, two topics that are of increasing importance in the food industry.

New products were developed in the field of functional food and convenience food. Functional and convenience food are the two main trends in the food industry that allow companies to increase revenues. As these products offer an additional use to the customer prices are higher than prices for normal goods, and, hence many companies try to enter into these markets right now. These products often demand completely new technologies and, hence, it is very difficult for SMEs to develop this type of products. Cooperations can help to overcome problems of low budgets and restrained resources.

4.3.8 Goals of cooperations

Cooperations in the network have two main goals:

On the one hand, cooperations should contribute to an improvement of competitive ability and innovation for the participating companies. To reach this goal, horizontal, vertical, and diagonal relations in the network are intensified. The improvement of the density of the network means increased cooperations between agriculture and the food sector and between science and economy.

On the other hand, cooperations should contribute to the good quality of Upper Austria as a region for companies to invest and establish new companies. In alliance with the development of the cluster also the education structure for the food industry should be improved.

4.3.9 Difficulties

The network has been very successful in promoting cooperation in the Upper Austrian food sector. Despite this success, some potential problems have to be addressed. They are discussed below.

Problem of objectivity in subdividing financial funds

The cooperations are supported with financial funds. It is quite difficult for those responsible to subdivide the financial funds objectively.

One difficulty that reduces objectivity is the fact that the cluster management is at the same time the agent of the institute that provides financial support and the agent of the participating companies trying to gain financial support. Sometimes it is quite hard to separate these duties.

As mentioned above, the federal government and “Interessensvertretungen” play an important role in the cluster. The “Interessensvertretung” is traditionally close to certain political parties. Hence, political influence on the development of the cluster is inevitable. It can potentially determine the receivers of the financial funds and the topics that are supported.

Although best intentions of the cluster management to subdivide the funds fairly are not questioned, the high potential of political pressure for support of members that are close to certain political parties and institutions cannot be neglected. This topic has a certain relevance in Austria as political parties have for several decades strongly influenced several fields of the economy. With the privatization of the public industry this influence is slowly being reduced and, hence, the fear of increase of political influence of the parties is high.

Concerning the topics of cooperation that are supported, the problem is again the strong political influence in the decision process. Companies have problems to obtain funds for projects that are not socially accepted in Austria. The problem is that the common belief in a society does not have to be true and that important developments in the economy could be lost just because a certain topic is not accepted in society.

Trust between companies

Again, missing trust between companies is one of the main obstacles to cooperation. A relationship has to be established and this process can only work slowly. Several activities of the cluster management focus on establishing this relationship.

Missing will to contribute

Cooperation can only work if all partners are willing to contribute to the cooperation. It has to create a win-win situation for all partners. Sometimes some partners do not want to cooperate but only want to take. This problem of moral hazard appears in all types of cooperation. The network reduces this problem. Information about someone who does not contribute would spread rather fast in the network and would limit further access to cooperations of an individual firm. This reduces the potential profit of this strategy.

4.3.10 Factors for success

The following factors were according to the cluster manager Miss Stadlbauer important for success:

The decision of important decision makers to contribute to this project

The main success of this project is that all important decision makers could be convinced to contribute to this project. This situation is unique in Upper Austria. In many other states the different institutions all try to create something on their own and block, rather than support, the others.

Public financing

Public financing was guaranteed from the beginning.

Engagement of the partners

In order to support the engagement of the partners a strong process orientation is necessary. This means that the partner companies have to be involved in the evolution of the cluster and that they have to be partners that take over management functions.

Conviction of the leading companies

To convince leading companies two main factors are important. On the one hand, good contacts are essential and, on the other hand, the time has to be right for the creation of the network.

As the first part of the work describes, pressure in the food sector is high. The companies know that they have to do something to survive. The food scandals were the point of initiative when the companies realized that they have to start cooperating. Some private cooperations existed before the installation of the Foodcluster but they suffered from a lack of time of the managers and money. Therefore, the managers were happy about the initiative started by the WIFI and started to participate.

4.3.11 Conclusion

The Foodcluster Upper Austria managed to create a large and active network in a really short period of time. They managed to significantly reduce costs of cooperation and to increase relationship capital. Very positive is the wide scope of the network that is not only composed of food suppliers but includes all relevant partners for cooperation. The network had the advantage of strong financial support. The future will show how the network will develop when the public funding will be reduced.

4.4 Clusters of the Export Offensive

In 1998 the Ministry of Economics of Austria assigned the Chamber of Commerce with the realization of the „Export Offensive“. The goal of this program was to increase exports to achieve a stronger diversification of the Austrian exports. Reasons for the necessity of this implementation was the fact that 80 % of all Austrian exports go to only 12 countries. Countries similar to Austria have a much higher amount of countries where they sell their exports.

The structure of the Austrian industry consisting mainly of small and medium-sized countries supports the idea of creating clusters as one company often does not have the financial resources to conquer new markets. In the following years 21 clusters were created in the Austrian industry. Two clusters in the food industry were created: the Austrian Foodcluster and the Foodcluster Southern Austria. [90]

4.4.1 The Austrian Foodcluster

The Austrian Foodcluster is a voluntary cooperation of different Austrian food production companies to better develop new export markets with the main focus on Northern Europe (Scandinavia), Benelux, England and other European countries.

4.4.1.1 Members

Only food producers are members of the export cluster. The participating companies are traditional, well-known Austrian companies with a high reputation in the branded product as well as the private label market. They offer non-alcoholic beverages, wines, oils, vinegar, salad dressings, biscuits, cheese, sausages, ham, deer, canned food, ready meals, jams and other specialties. Together they have a total number of employees of 2.100, a turnover of 635 million Euros and 15 production sites in different parts of Austria. On average, they export 20 % of their goods. Potential new partners are strictly selected by the current members according to their standards of quality.

[90] see Schramel in: Clement, 2001, p. 11

4.4.1.2 Partners for cooperations

Partners for the food producers are mainly customers and intermediaries, managers from wholesale, retail or gastronomy, agents, distributors, importers and partners for license production.

4.4.1.3 Structure of the cluster

The cluster has a manager who has her office in Germany. There does not exist any formalized information, such as an information brochure because this would be too time consuming for her as she has to do all the duties on her own. The main type of communication is email followed by telephone calls. The members are content with the current state of information.

The companies contribute the participation fee, their knowledge and their contacts.
The members receive concrete suggestions for export. Only a small increase in exports could be determined. The organization of the members nearly did not change. They are only weakly integrated into the cluster. There is no central place where the companies can go to with their demands.

4.4.1.4 Duties of the cluster management

The cluster manager's duties are: to travel, to collect information on different markets, to prepare market studies, to present the products of the cluster at trade shows, to make new contacts, to permanently inform the members of the cluster, and to develop new strategies for exports. She has to be an expert in marketing and management of cooperation. She meets the members of the cluster from time to time in Vienna. Her role in the network is very important as she initiates the main developments, gives directions and makes sure that the network continuously improves.

4.4.1.5 Types of cooperations

Only cooperations in the field of the increase of exports are intended and supported by the cluster manager.

4.4.1.6 Difficulties

The companies in the clusters also have to face some severe obstacles to cooperation:

Weak links between export financing services and production

A first general analysis of all the export clusters indicated that the main drawback in these networks is that the links between export financing services and production are still not sufficiently developed.

Financing of the cluster

The cluster was only financially supported by the government for two years. Since the end of 2000 the members have to pay all the expenses with their membership fees. These fees had to be increased several times. The paybacks come only slowly as it needs time to develop the necessary contacts for the exports. Now many members of the networks start to become quite impatient.

Concurrence-cooperation

As stated above, one of the main difficulties is the situation that companies have to change their mindset and move from someone who always competed on his own to cooperating with others. Missing trust is, hence, most of the time the factor mainly hindering the faster development of cooperation. The cluster tries to avoid this problem by the selection of the participating companies. But the problem is that the members are very inhomogeneous. Direct competitors are not allowed to participate in the cluster. Rather, they try to create a cooperation of companies that offers complementary products.

Moral hazard

There are some companies more interested in the outcome that invest lots of time and energy into the development of the clusters whereas others just try to use the benefits while not investing anything. This problem can never be completely avoided and the problem is that it strongly adversely affects the active members as they feel used and won’t participate in the cooperation anymore. The structure of this cluster tries to reduce the problem. All the participants have to pay their membership fee. The main work is done by the manager and she will give this information equally to all

members. In addition, the strict selection of the companies makes sure that only companies that fulfill a certain level of quality become members.

Rigid networks

The problem of rigidity does not exist that much as the network is quite flexible. Members continuously enter and leave the cluster. As the network is mainly focused on one person it is not as difficult to leave the network as it is in other networks where the relationship between the members is really strong. Because of the looseness of the network some potential gains can be missed.

Exchange of information

The continuous exchange of information is quite a problem as the cluster manager is not in Austria and is traveling quite a lot.

Definition of common goals

The participating companies all have their own goals and aims. It is quite difficult for them to determine the common goals. The right method has to be used so that all partners have an equal share of influence.

Missing management of knowledge

No knowledge platform and no information brochure or email exist.

4.4.1.7 Benefits

A first analysis of all the export clusters showed that information exchange and market entry in the participating companies increased. But it is very difficult to quantify the benefits as it is hard to determine exactly which exports were due to the membership in the cluster and because companies are very reluctant to give information about the number of sales. Generally two main benefits can be observed:

Reduced complexity for customers

At trade shows the cluster manager offers the products of the Foodcluster as one product offer. This significantly reduces complexity for potential customers in the retail and gastronomy business especially at the beginning of a partnership because

now they only have to deal with one partner instead of several if they want to order a product.

Cost reduction for building up new markets

It is very time and money consuming to build up new markets. High investments for market research, communication, travel expenses and market tests are necessary. When this information is shared costs occur only once and, hence, the cooperation can significantly reduce the costs for the individual firms.

4.4.1.8 Conclusion

The cluster is, in my opinion, by no means a cluster but rather an export cooperation. It seems that the cluster has to face some severe problems. The main and most urgent problem is the missing financial support. Due to the reduced financial support only one person works for the cluster. There does not exist any regular information about the cluster and its activities. The members are quite inhomogeneous and cooperation does not seem to work very well.

4.4.2 Foodcluster Southern Austria

The Foodcluster Southern Austria is a cooperation among five Austrian food producers that are located in Carinthia and Eastern Tyrol.

The main company is B&P-Gastro, a young enterprise from Carinthia, which is producing „Kärntner Nudeln“.

4.4.2.1 Initiative and public support

The network was installed in 1998. The cluster is also part of the “Export Offensive” of the government. Hence, the initiative for the installation was taken by the Chamber of Commerce. At this time the Austrian food cluster was already in action but it had to face some challenges. The network was already too big and inflexible and the group of participating members was very inhomogeneous. Hence, the companies decided to create their own network. The network had around 20 members at the beginning. Now it consists of 5 companies.

4.4.2.2 Main stakeholders

At the beginning, the cluster was financially supported by the government but this support stopped after the change in government in Austria. Now the cluster works without any external financial support. It is solely financed with membership fees.

4.4.2.3 Members and structure of the network

The cluster has currently only five members. They all have an equal position in the network. The cluster manager called the network a cluster without a center. It does not have an external cluster manager but a manager of a participating company took over the agents of the manager. The network only employs an agent for sales.

The members meet regularly 1-2 times a month. They keep in contact with regular phone calls and email. No information brochure or information email exists.

4.4.2.4 Duties of the cluster management

As the cluster is really small and consists of only five members the cluster manager does not have to do many things. He is only responsible for general administration in

the cluster, like the organization of meetings. Initiative for cooperation comes from all members.

4.4.2.5 Types of cooperations

The cooperations in the network are only cooperations among the five companies. No cooperations with universities, research institutes, schools or other companies took place in the network.

4.4.2.6 Fields of cooperations

At the beginning this cooperation focused solely on an increase in exports. The main goal of the participating companies was to gain access to new markets. Hence, they focused on common marketing, exchange of information about export markets and cooperation in sales. Some companies left the network as soon as they got access to these markets.

The five current members are very homogeneous. In their regular meetings they discovered that there exist also other possibilities for cooperation. Now they have started using synergies in different fields, they have begun to exchange information about markets and to start cooperations for cross-selling of products. The members did not start any cooperation for common R&D.

4.4.2.7 Difficulties

The main problem in the cluster is the lack of financial support by the government that makes it very hard for the network to operate. The cluster had been ensured to achieve these funds and the sudden cut of the support created really hard difficulties for the members.

Besides the lack of financial support the network has and had to face the usual problems in cooperations like missing trust. Especially at the beginning it was very hard for the members to find common goals and to define a common strategy. These problems had already been described in depth in the previous part about the Austrian Foodcluster.

4.4.2.8 Benefits

According to the manager the main benefits are that many companies that had been members left the cluster as they had reached their goal and achieved access to new markets where they operate now. This was again due to the fact that the cluster could reduce costs for the singular firm to enter a market as costs for obtaining information and participating in exhibitions could be subdivided among the members. Without the network some of the companies would have never tried to enter these markets as they lacked information and financial resources.

Another success is the fact that the network now consists of very homogenous members that can cooperate very well.

4.4.2.9 Conclusion

The network has significantly decreased in size since the beginning of the cluster initiative. This is for sure due to the fact that the cluster is not publicly financed anymore. This reduction in financial resources had the positive effect that only the companies that really benefit from the cluster and that are interested in cooperation stayed there. These companies form a very homogeneous group now. The problem is that the financial support was stopped abruptly and that the cluster had to adapt to this situation very fast.

Despite the fact that the cluster members intend to widen the scope of cooperations, the increase in exports still seems to be the dominant goal of the cooperations.

As the cluster shows, regular meetings and regular information exchange increases the probability for cooperations. Hence, I expect that the five member companies will further increase their cooperations in the future.

4.5 FOODNET Salzburg

4.5.1 Initiative and public support

FOODNET Salzburg was created in 2000 between five medium-sized companies as a private initiative. These five companies together had a turnover of 4,1 billion Austrian Shillings and employed 1.500 employees. The section industry of the Chamber of Commerce, the company SYNACT from ST. Gallen and the EBS, the technical bureau for food and biotechnology /Anif are strongly involved in the project.

FOODNET is based on the idea of a virtual company. “The goal of a virtual company is to establish a kind of a “Best of everything Organization” by a synergetic combination of core competencies of single partners (centers of competence) in order to perform a given business project to a maximum degree of customer satisfaction. Important features are a distinct form of network structure in combination with a high degree of organizational flexibility.”[91]

At the beginning of the cooperation, a project plan for two years was created and working groups in the fields of purchasing, energy, plant maintenance, quality management, insurance, e-commerce and vehicle fleet were installed.

4.5.2 Members

Current members of the network are the companies: WIBERG, Salzburger Schokolade, Salzburger Land and Stiegl. At the beginning of the cooperation the company Seeburger had also been a member but after it had been taken over by a bigger company it left the network.

In the initial phase the companies did not want to accept new members. Their priority was an increase of cooperation between the current members. At this time not many companies knew about the network because the members did not actively promote the network. After the first common projects were successful, the partners in the network thought about enlarging the network.

[91] Tuma, 1997, p. 1

Now the network is open for new members. New members have to apply for membership and the current members check their application before they accept them as new members. Criteria for becoming a partner in the network are: the company has to be a branded company, it has to invest in research and development, it has to have a certain minimum size and its participation in the network has to add some value to the cooperation. So far no new member has been accepted.

4.5.3 Structure of the network

Currently four companies participate in the network. The executive committee prepares strategic steps. Decisions are taken in the meetings of the owners. The executive committee is mediator and point of information for the owners of the companies. Working groups are installed for specific topics. They support the projects and provide the stakeholders with information about concrete developments and results.

4.5.4 Examples of projects in the network

The first success of the cooperation was a reduced price for electricity that could be achieved in negotiations with the Salzburg AG. As the participating companies bundled their resources they could achieve better conditions as multi-utility clients.

Also, a cooperation with a packaging producer was started. The packaging company was a local company and the agreement had positive effects for the FOODNET as well as the packaging company.

Currently, the FOODNET Salzburg further advances cooperations. FOODNET plans the creation of a competence center. This competence center will, on the one hand, be a supplier of advanced training but it will, on the other hand, also offer consulting services and additional services, like the rent of pilot plants. As the installation of a competence center demands significant financial resources FOODNET applied for being accepted to the K-ind program, an initiative of the Federal Government. The goal of the K-ind program is to increase pre-science research by supporting cooperation between companies and science. [92]If the project is accepted, the government finances 40 % of the project and the local government finances 20 %.

[92] see Leo, 2001, p. 16

Following internal calculations the costs of the creation of the network have been amortized by several projects after one month.

4.5.5 Types of cooperations

Right now cooperation takes mainly place between the member companies in the network. The links between the four companies have become really tight and cooperations are initiated in many fields.

Also vertical cooperation played an important role from the beginning. FOODNET tries to cooperate with local suppliers. The suppliers are, although some of them were at the beginning a bit skeptic, also very positive about cooperation with the network. These cooperations give the suppliers the possibility to sell larger amounts of goods at one time. The fact that they can trade with only one person simplifies the whole process. As this type of cooperation is rather new in Salzburg both partners can learn from this process. The suppliers can use their new knowledge to tighten links with other customers. The stronger linkage with suppliers corresponds to the current trend of supply chain management and enables the partners to increase the quality of their products.

Each company cooperates in some fields with universities and research companies. These cooperations are very specific for each company because the companies produce different products. Hence, common cooperation projects with universities did not take place so far. This will change as soon as the planned competence center for the food industry starts working because universities and research institutes will be important partners for the competence center. The start of the competence center is planned for the year 2003.

4.5.6 Fields of cooperations

The main field of cooperation is the internal transfer of know-how. Common purchasing also played an important role from the beginning. Research and development and the qualification of employees will play a very important role as soon as the competence center will start working. In the field of marketing companies exchange knowledge about markets and current trends. A very successful idea for cooperation is that marketing teams of the different companies present their

new projects to teams of other member companies. Employees of the other companies give some feedback on the presentations and help to develop new ideas. In addition, several cooperations in the field of insurance, maintenance, computer maintenance and quality safety take place.

4.5.7 Goals of cooperations

The main goals of cooperations are an increasing internal exchange of information, an increasing potential for innovation by pooling the resources, common use of synergies, efficient communication between the partners in the network, increasing international competitive ability, and increasing cooperations with other economic units.

4.5.8 Difficulties

The members stated that they had to fight with rather few problems because the team of the executive committee worked together really well from the beginning and because the owners strongly support the project. Problems with which they had to cope were resentments from different people in the companies and the differences between the cultures in the participating companies.

4.5.9 Benefits

Due to the creation of the network the critical size for R&D can be achieved, resources can be pooled and costs can be reduced for the single company. A success is that the cluster could survive the first years despite the fact that it is self-financed. As former examples show the financing of the cluster activities has been a problem for other similar initiatives. Very important for the partners is also that the network has a very high public reputation now .

4.5.10 Changes in the participating companies

The participation in the network caused significant changes in the participating companies:

- The companies became more open for and more interested in benchmarking.
- The willingness to cooperate increased.
- The companies started to define suppliers and main suppliers.
- E-Procurement became an important topic.

- PR became more important.
- Cross-Selling between the companies increased.
- The companies became more valuable and their image improved because of their participation in the FOODNET.
- Public interest and public support increased (FOODNET became a part of the "Wirtschaftsleitbild Salzburg").

4.5.11 Factors for success

The first important factor for success was a strong support of the development of a common culture. A common culture has to grow, it needs some time to develop and the informal contacts are very important. The geographic proximity of the companies supported the development of the common culture. Also several informal activities, like a common skiing day, supported the creation of a common culture. For sure, some resentments still exist and the development of creating a "FOODNET-culture" still has to continue.

A culture for cooperation has to be developed in the whole company. The idea of cooperation has to be present in all layers of the company. On the one hand, it is very important that the cooperation is strongly supported from the top and that managers on the top show their concern for the development of the cooperation. On the other hand, an equivalent development of cooperation from the bottom is necessary.

It is very important that the vision and a common strategy is clearly defined at the beginning. Although a common agreement is sometimes hard to reach, this initial phase is decisive for success.

The role of the executive committee, which is the mediator between the owners of the different companies, is very important.

The fact that the participating companies were no direct competitors made cooperations for the participants much easier.

Very important is also that the cooperation started with small projects that could be finished in a short period of time. This proceeding has the advantage that success can

be seen really fast. This will increase the motivation for the participants and give the decision makers the feeling that cooperation really increases their companies` competitiveness. These small projects also achieve first financial benefits and, hence, increase the financial resources available for new cooperations. In addition, these small projects help to create trust among the companies.

4.5.12 Conclusion

FOODNET Salzburg is a cooperation between a very homogenous group of companies. The cooperation was set up in a professional way with the help of a consulting company that had experience in setting up networks like this.

The success of the first projects and the high public reputation are strong indicators for the success of this cooperation. The cooperation is very positive especially if one concerns the relatively low public financial support of the network in comparison to the other networks that I described. Trust among the participants is really high and, hence, the high intensity of exchange of information leads to a high potential for cooperation that is strongly exploited. The creation of the competence center will further increase the relationship between the participants and it will also increase cooperation with universities and research institutes. The strong increase in vertical cooperation promises high potential gains, especially a significant increase in quality.

One problem that could become important in the next years is the fact that the network structure is really tight and that it is further tightening with each project. This is, on the one hand, necessary to exploit the full scope of potential cooperations but, on the other hand, it also bears the risk that the network becomes rather inflexible. It will be very important and decisive for the success of the cooperation that the network stays open for new partners for cooperation and that the network still retains a certain flexibility.

4.6 Technology network of the LVA

4.6.1 Initiative and public support

The network was installed in 1999. Preparations for the cluster started in 1998. The main partners involved in setting up the cluster were the industry union of the food industry and the LVA. The LVA is a private food testing and food research institute in Austria.

At the beginning, the project was strongly supported by Mr. Eysenberg, who had been working for Unilever and who had a strong interest in the improvement of the food industry in Austria and the consultant Dr. Kastner. Their main contributions to the development of the network were a feasibility study for the network and some first search for potential partners.

The LVA was chosen as the best institution to set up this network as it had high competence in quality certification and food analysis. The LVA was very interested in the project because it offered the possibility to gain additional financial resources and because the LVA needed additional sources of revenue at this time. After the decision to set up this network had been taken, the LVA started annual meetings with experts in the food industry. In these meetings the participants talked about potential cooperations. Then, managers of the LVA started to travel around and make presentations to promote the idea of cooperation and to convince food companies to participate in cooperations.

4.6.2 Partners in the cluster

20 institutes of universities, federal agencies, HTLs in Hollabrunn and Wels, and schools are members in the network. In addition, companies working in the food sector and cooperative research centers participate in the cooperations. The partners are mainly located in the eastern parts of Austria. The network has very few partners in the western and southern parts of Austria.

4.6.3 Structure of the network

The competence network has a very flexible structure. The LVA is the center of the network. Partners in the network change all the time. The network is not constructed

to create long-term relationships between the partners in the network. Companies participate in a certain project and usually leave the network after finishing the project. An official membership and, hence, membership fees do not exist.

4.6.4 Duties of the cluster management

The cluster manager acquires partners for cooperation. In 1998, neither the companies nor the research institutes and the universities were very eager to participate in cooperations. Especially at the beginning, it was the duty of the cluster management to travel around, inform companies about the possibility of cooperation and convince them to participate. Without public funding just very few companies would be willing to cooperate. Many projects that are initiated by the network are funded by the FFF, the “Forschungsförderunsfond“, a public fund that supports research projects.

The manager helps the companies that participate in a cooperation to set up projects and to write project plans. A very important duty of the cluster manager is that he helps companies to apply for public funding, public funding from Austrian programs but also public funding from the European union. This help is necessary because it is very difficult and time consuming to write the application to achieve funds, especially funds from the EU. SMEs often have neither the knowledge nor the necessary time to fill in these forms.

The cluster manager also organized annual meetings with the experts for several years. These meetings did not take place last year. The managers also organized a common presentation at an exhibition once but due to missing success this initiative was not taken anymore.

4.6.5 Types of cooperations

During the last years the network applied with 30 projects for financial funds of the FFF. The main types of cooperations are cooperations between companies and universities, schools or research institutes. Horizontal cooperations between the companies are rather seldom because many companies are not willing to share their knowledge with their competitors. Currently one project creates a vertical cooperation. This is an exception. Vertical cooperations usually were not installed.

4.6.6 Fields of cooperations

The main field of cooperation is development, mainly process but also product development. As companies in Austria rather imitate foreign products than innovate, these initiatives are very important. The development rate of new products in the food sector is rather low in Austria. The reason is that SMEs often do not have the necessary funds to have their own development department. The big companies that produce food in Austria are often affiliates of large foreign multinationals. These multinationals have their research and development centers in their home countries and, hence, do not invest in R&D in Austria.

4.6.7 Goals of cooperations

The main goals of cooperations are: to increase successful process and product innovations in the food industry in Austria, to use the knowledge that is available in the universities and research centers, and to make the participating companies, hence, more competitive.

4.6.8 Difficulties

Many companies in the food sector are not used to cooperations. It is very difficult to convince them of the idea to cooperate. They still lack experience in cooperations, do not know how to communicate, how to keep time constraints and how to keep processes transparent.

There is a big difference in attitude towards and experience in cooperation among universities. Some universities already have participated in cooperations for a long time. They know how they have to work in cooperations with companies and what companies expect. Other universities and institutes do not have any experience with cooperations with companies. For a long time, it was not necessary for them to cooperate because all their expenses were paid by public funds. Due to restricted public financing they are now forced to cooperate. Some of them have difficulties now to adapt to the new situation. They have to learn how to conduct a project with companies. It is very difficult for professors in these institutes to fulfill the demands of companies. Companies demand results really fast and they usually do not care very much about proofs of every little detail. This is very unusual for professors used to conducting academic research.

Another problem of the cluster is that many partners are not very active in the network. They just take help whenever they need it but do not contribute to the development of the cluster.

4.6.9 Benefits

The innovation culture in Austria has changed during the last years and companies became much more willing to cooperate. A proof for this development is the history of the „food initiative“ of the FFF. The FFF had started his first „food initiative“ before 1998. The „food initiative“ means that the FFF offered financial support for cooperation projects in the food industry. But as very few companies applied for these funds, the initiative stopped. The FFF started a second „food initiative“ in 1998 and this time it was a success. This time the demand for public support was that high that the initiative had been prolonged for another two years twice. The managers of the competence network of the LVA believe that this success is strongly due to their initiatives, especially the presentations for companies.

Some projects that were initiated by partners in the network were really successful and the companies could gain high financial gains. Examples of successful projects are projects with the companies Wiesbauer and Prof. Berghofer.

4.6.10 Conclusion

Very positive is that the initiatives of the LVA contributed to the development of the idea of cooperation in the Austrian food industry. This is very important because cooperation is necessary to increase competitiveness of the food sector. The LVA started its initiatives at the right time, a time when companies became more and more interested in cooperation. Nevertheless, the LVA did not manage to create a real network. The LVA works rather like a service institute that offers several consulting services and that matches the right partners for cooperation. Some of these cooperations were really successful but the LVA did not manage to keep the partners in the network. Whereas some universities and research institutes are permanent members, companies usually leave the network really fast. Hence, many potentials for cooperation that result from permanent formal and informal contacts between the participants were not used.

The fact that some of the projects and the partners are secret shows that the innovations in the network will in most cases only help one or two companies. As there are no regular meetings the knowledge cannot spread. This fact raises the question if the strong public funding is justified because very few external effects can be observed.

5 Conclusion

Cooperation has significantly risen in importance in the food industry in Austria during the last five years. The general change in the Austrian industry from an catching–up technology taker to the role of an innovation leader, increased competition due to membership in the European Union, the structure of the industry, that consists mainly of SMEs, the strong concentration in the retail industry, and changes in the food sector that made it more difficult for SMEs to survive were the main reasons. Government programs, especially funds of the FFF, were installed to support these cooperations.

Despite the benefits of cooperation, companies were still reluctant to cooperate before 1995. The main reasons were traditionally weak links with research institutes and universities and the not very well developed culture of cooperation among SMEs. To overcome these obstacles to cooperation, formal competence networks were installed in the food sector in Austria.

In this paper I described five networks which are distinct because of their size or the intensity of cooperation. All the networks started their work between 1998 and 2000. It is noticeable that none of them is located in the western part of Austria and that networks that are open for members from all parts of Austria have only few members from the Tyrol and Vorarlberg, the two western regions. It is also noticeable that all networks were installed nearly at the same time. Factors supporting this development were the increasing will of companies and universities to cooperate and the strong support by government and federal states, especially Upper Austria. All the networks were supported by funds from the government and in some cases government or a federal state even paid all the expenses. This shows that government strongly believes in cooperation as a tool to increase the competitiveness of industries, despite the fact that it does not support the export cooperations any more.

5.1 Competence networks support cooperation

It seems that these networks have, as predicted by theory, contributed to the general increase of cooperation in the industry. Concerning the improvements in the network structure that could be achieved, one has to differentiate between large and small networks.

5.1.1 Large networks

The large networks Foodcluster Upper Austria and Technology network of the LVA, mainly work like an information and consulting platform. They were able to significantly reduce information costs because they provide information about possible partners for cooperation. They also reduced problems caused by missing experience in cooperation because they offer consulting services. Access to these networks is unrestricted.

In my opinion, it would be really important to think about some sort of criteria for participants, especially in the case of the Foodcluster Upper Austria. This would enable cluster managers to focus more strongly on the individual participants and to get rid of partners that only take but do not contribute to the network. As long as much financial resources are available, this does not seem to be necessary, but restrictions in financial funds could make this decision necessary. In addition, it would enable the cluster to become more financially independent.

5.1.2 Small networks

The small networks FOODNET Salzburg, Austrian Foodcluster and Foodcluster Southern Austria consist of four to eight members and participate mainly in horizontal cooperations. They try to overcome the distinct problems of small companies by forming a network of companies. In two cases this is a network which focuses only on exports and in one case cooperations in many fields take place. The members are, after a phase of consolidation, always the same and new members are carefully chosen. These networks have significantly reduced trust costs as successful cooperations in one field lower the risk to participate in another cooperation. As the examples of FOODNET Salzburg and Foodcluster Southern Austria show,

cooperations in several fields develop. These networks should try not to stay too closed and accept contributions from partners outside their network.

5.1.3 Both types of networks

It seems that both types of networks, especially the Technology network of the LVA, the Foodcluster Upper Austria, and the FOODNET Salzburg could change the attitude of companies concerning cooperation. As these networks are strongly supported by government and observed by media other companies get aware of and interested in cooperation and, hence, the will to cooperate increases.

5.2 Important factors for success

The strong support of the network by all the partners is essential for success. Without the commitment and the strong will to cooperate, no network can be successful. Especially at the beginning, many problems will appear and it needs someone with the necessary energy to overcome these problems.

Very important for all cooperations is the creation of informal networks that strongly improve the network structure and significantly increase the probability for cooperation. The creation of informal networks is especially supported in the case of FOODNET Salzburg, Foodcluster Upper Austria and Foodcluster Southern Austria. The other two cooperations should try to support these networks by organizing regular meetings, seminars, workshops, etc.

The problem of financial resources needed to install a network is still a very important one. As the examples show, companies are very willing to participate in a network as long as membership is free, but they are much less willing to participate if they have to pay a membership fee. This problem could be solved in some cases by the strong financial commitment of the government or the federal state. In other networks the participants had to pay all the expenses by themselves, either from the beginning or after some time. The networks that have strong financial support from public funds have to try to get as independent as possible from public funds. Public financial support cannot be guaranteed forever, as the example of the export clusters shows.

Very important for the success of the networks is that cluster managers regularly think about their strategy and ask themselves if they are on the right way to achieve their goals. I hope that this work could increase the awareness of the necessity of self-reflection and that cluster managers were motivated during the interviews or will be motivated when reading this work, to think about their network and possible improvements in the network structure.

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Ich erkläre hiermit an Eides Statt, dass ich die vorliegende Diplomarbeit selbständig angefertigt habe. Die aus fremden Quellen direkt oder indirekt übernommenen Gedanken sind als solche kenntlich gemacht.

Die Arbeit wurde bisher weder in gleicher noch in ähnlicher Form einer anderen Prüfungsbehörde vorgelegt und auch noch nicht veröffentlicht.

Innsbruck, August 2002