【Note】

The Socio-economic Importance of the Dutch Food, Beverage and Tobacco Industry

Leo Dvortsin*, Kazuyuki Miyabe**, Tom Bakker*, and Krijn Poppe***

1. Introduction

This study note contains a literature review on the socio-economic importance of the Dutch food, beverage and tobacco industry (FBT industry)[1] and its competitiveness. No attention has been paid to future developments.

The Dutch agrifood complex contains a whole chain of economic activities (see figure 1) : the primary sector - including farmers, growers and fishermen; the FBT industry; the wholesale trade; retailers and hotels, restaurants and bars; consumers; as well as the manufacturing industry, suppliers and transport & logistics. The FBT industry is often presented as a small part of the entire chain. In this case study we put the FBT industry in a central position, sourcing from the agricultural sector as well as trading and selling to the retail sector.

First we present a concise overview of the structure of, and value added by, the Dutch FBT industry. Next we will analyze its competitiveness on export markets and comment on how the financial crisis has affected the industry. On the basis of this discussion an analysis elaborated on strengths, weaknesses, opportunities and threats to

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* Agricultural Economics Research Institute-LEI, Wageningen UR, Researcher
** Department of Food Business, Associate Professor *** Agricultural Economics Research Institute-LEI, Wageningen UR, DLO-BU manager

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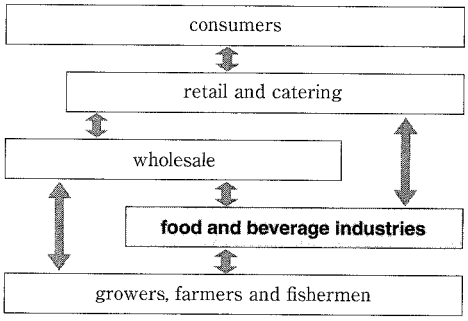

Figure 1 The FBT Industry's Source and Supply Chain

Source: Bijman et al. [3]

the Dutch FBT industry. This case study focuses on the competitiveness and innovation potential of the industry.

2. The present conditions and tendency of the Dutch FBT industry

Contribution of the FBT industry to total Dutch industrial activities

The Dutch FBT industry is the largest economic sector within the Dutch (manufacturing) industry. The top five sectors in order of size are: 1) FBT industry; 2) primary chemical products; 3) machine manufacture; 4) publishing and printing; and 5) metal products. CBS (Dutch Central Bureau of Statistics) national accounts show that the FBT industry outperformed all other industrial sectors in terms of added value during the period 1995-2005.

Sub-sectors in the FBT Industry

In 2009 the FBT industry contained approximately 4,600 companies, with a large diversity of products and production methods. The CBS definition is most commonly used, classifying the FBT industry into 13 sectors, including slaughterhouses, meat products, dairy, ice cream and sorbets, fish-tinning, soft drinks, breweries, confectionery, bread and pastry, etc. (see table 1). CBS, LEI and the LNV (Ministry of Agriculture, Nature Management and Food Quality) (see LNV- Facts and Figures [8]) classify the tobacco, beverages, and fruit and vegetables sectors entirely within the FBT industry. No distinction appears to be made between raw materials (e.g. fresh fruit) and processed products (e.g. tinned fruit or syrup).

The Dutch FBT industry compared to other EU countries

With a production value[2] of over 47,000 million euros the Dutch FBT industry is the

Table 1 Key Statistics for the Food, Beverage and Tobacco Industry in the Netherlands (2005)

	Number of companies	Employees persons (x1000)	Net Sales (million euros)
Total number of companies			
Industry	45,505	847.0	252,594
Food and beverage industry	4,585	152.8	54,700
Companies with >100 employees			
Industry	1,255	431.6	186,068
Food and beverage industry of which:	215	86.2	41,721
Slaughters and meat processing industry	45	15.8	5,159
Slaughters (excl. poultry)	15	4.8	2,665
Poultry Processors	10	3.0	843
Meat	20	7.9	1,651
Alcoholic beverage industry	5	x	x
Fruit and vegetable processing industry	25	8.6	2,635
Fats and oils	5	2.1	4,714
Dairy industry	10	x	x
Flour Mills	5	3.1	1,456
Feed	15	4.8	2,800
Bread, pastry biscuits e.d.	35	10.5	1,596
Cocoa and chocolate drinks industry	10	5.1	3,070
Beverage industry	15	7.5	3,343
Tobacco Manufacturing industry	10	4.7	5,410
Other nutrition and beverage	35	x	x

Source: LEB [12], Original source: CBS Statline

Note: Acknowledgements to the Marketing Board for Dairy Products/Productschap Zuivel for providing additional data on the dairy industry, which employed 10,800 people in 2005 and had a product value of 5,000 million euros.

sixth largest within the EU-15. In terms of export value it ranks third, after France and Germany. The Netherlands rank first for processed meat, fruit and vegetables and margarine, fats and oils, sectors in which the country has relatively many large-scale companies (LEB [10]).

The agrifood sector continues to make a large contribution to Dutch exports, some 37.5% of the total. This is twice the global average (WTO, 2005; in Jacobs et al. [16]). This is consistent with the Dutch FBT industry being proportionately twice the size of that than in other EU countries: 26% as opposed to 13% of the overall industrial sector (De Bont et al. [4]).

Food, beverage and tobacco industry's place in the chain

The added value of the Dutch FBT industry was 12,100 million euros in 2007, accounting for approximately 25.3% of the total added value of the Dutch agri-complex and approximately 2.5 % of the entire Dutch economy. Companies in the FBT sector have an average turnover of 11.8 million euros and an average of 35 employees. This makes them approximately twice as large as companies in the industrial sector as a

whole (LEB [10]). In 2005, the turnover of the FBT sector amounted to 54,700 million euros. It provided employment to 152,300 people, compared with 846,800 in the industrial sector as a whole (2006 data).

Almost 1 in 6 employees in the industrial sector works in the FBT sector and almost 10 % of the companies in the whole industrial sector are active in the FBT industry. However, the number of companies in this sector is slowly but steadily decreasing. Since the year 2000 employment in the FBT industry has decreased by almost 11%, slightly less than for the industrial sector as a whole, where employment decreased by just over 12% (LEB [12]).

In no other industrial sector has the process of mergers and concentration been more to the fore than in the FBT industry. This process has been partly driven by applying combined buying power at national and EU level, which provides supermarket enterprises with chain control, so that they can set their terms for suppliers. Retail is the most important customer for the FBT industry; the bulk of its production is supplied to the major supermarket enterprises (Bijman et al. [3]).

Business size

The majority of enterprises in the FBT industry are Small and Medium Enterprises (SMEs). In 2004, the sector included 3,730 enterprises employing less than twenty people and 615 companies with 20-100 employees. The small companies (< 20 people) employed around 33,700 people and had a turnover of 3,000 million euros. The 615 medium size companies (20-100 people) provided employment to 34,400 people and had a turnover of over 9,000 million euros (LEB [10]). The smaller companies often market niche products or produce for local or regional markets. In spite of an increasing homogenization in European consumption patterns, regional and national differences have still remained. Small companies can often meet this demand better than large ones (Bijman et al. [3]). The 220 large companies, with more than 100 employees, account for the bulk (77%) of the turnover of companies in the FBT sector. They account for almost 56% of employment in the sector.

Dutch industry includes 25 very large companies, with 2,000 or more employees. Several of these are found in the FBT industry, see table 2 (LEB [12]).

In 2007, added value amounted to 12,100 million euros: 63.6 % of this was produced from processing imported raw materials. By sourcing raw materials, the industry

Table 2 The largest Dutch Food Companies, in order of size, in 2008

	Worldwide Turnover (million euro)	Turnover Netherlands (million euro)	Total number of employees	Product group (s)
1. Unilever	40,523	n.a.	174,000	Food and beverage
2. Heineken	14,319	n.a.	56,208	Beverage
3. VION Food Group	9,600	n.a.	35,000	Meat, ingredients e.d.
4. FrieslandCampina	9,454	2,798	20,568	Dairy
5. Nutreco	4,943	833	9,278	Feed, fish, meat
6. CSM	2,599	154	8,433	Bakery ingredients and lactic acid
7. Cosun	1,689	n.a.	4,266	Foods and ingredients
8. Wessanen	1,603	169	5,761	Health food and snacks

Source: LEB [12], Original source: Jaarverslagen en websites ondernemingen.
Note: n.a.= not available

Table 3 Key Statistics for the Dutch Agri-complex, 2001 and 2007

	Added value (factor costs, ×1,000 €)		Employment (×1,000 working years)	
	2001	2007 (r)	2001	2007 (r)
Food, beverage and tobacco industry (a)	**9.8**	**12.1**	**123**	**107**
of which on the basis of domestic raw materials	3.2	4.4	50	42
of which on the basis of foreign raw materials	6.6	7.7	73	65
supply and primary production (b)	**19.7**	**22.8**	**390**	**368**
of which primary production	7.6	8	184	169
Distribution (c)	**7.3**	**8.8**	**129**	**134**
Gardeners, agricultural services, forestry (d)	**3.7**	**4**	**75**	**64**
Agri-complex (a+b+c+d)	**40.5**	**47.9**	**717**	**672**
Contribution to the national total figures	*10.20%*	*9.60%*	*10.80%*	*9.90%*

Source: Agricultural input-output table, adapted by LEI, LEB [13]
Note: Due to a revision of the National Accounts (Nationale Rekeningen) and methodological modifications these figures may differ from previously published data

generated an added value of 22,800 million euros in the supply sectors; including 8,000 million in the primary sector. Another 8,800 million euros of added value was generated in distribution (table 3). The international orientation of the FBT industry has clearly been increasing. In 1985 about 27 % of gross value added was based on foreign raw materials, while in 1997 this figure had risen to 33% and more recently (2007) to 38%.

The Dutch FBT industry's strong integration in international markets might raise questions about the strength of its bonds with the Netherlands. Classifying raw materials, as domestic or foreign, suggests that if a competitive advantage were to be gained, production facilities for foreign raw materials could be easily transferred to other regions. However, it is not that simple. Companies that utilize domestic raw materials can have reasons for expanding their production (possibly with older machines) or even completely transferring to e.g. Eastern Europe.

By contrast, those parts of the FBT industry that are relying on foreign raw materials can be very strongly linked to the Netherlands, because of its harbor facilities,

access to consumer markets in North-Western Europe, or other kinds of supporting activities that historically reinforced the industrial complex (e.g. cacao). Analysis of figures on foreign direct investment shows the Netherlands key role in this (see below; source: De Nederlandsche bank/DNB).

Foreign investment in the Dutch FBT industry

Direct investment by foreign companies in the Dutch FBT industry amounted to over 33,600 million euros in 2006 and to 45,500 million euros in 2007; a growth of over 34% on the previous year. These investments tend to aim at gaining representation on, or control of, the board of Dutch FBT companies (LEB〔11〕).

US companies have been investing strongly in the Dutch FBT industry. Between 2005 and 2007 their investments amounted to 23,300 million, 22,100 million and 22,800 million euros respectively. In 2007 this figure represented half of the total foreign investments.

In 2006, the United Kingdom invested almost 3,200 million euros and was the most important investor from the European Union, followed by France with 1,600 million euros (LEB〔11〕). In 2007, France was again an important investor, accounting for 13,800 million euros. This sum was almost entirely accounted for by the dairy concern Groupe Danone, which took over Koninklijke Numico for more than 12,000 million euros (LEB〔12〕).

Investments abroad by the Dutch FBT industry

Investments by Dutch companies in the food, beverage and tobacco industry abroad amounted to 31,600 million euros in 2007, compared to 17,000 million euros in 1997. Over half of these investments (54 %) were placed within the EU. Belgium and the United Kingdom were the most important countries, followed by Germany, France, Italy and Spain. Outside the EU, Dutch companies focused on the United States, Central and South America and Switzerland. In 2006, Dutch companies invested over 6,700 million euros in the US. Mostly large Dutch multinational enterprises have established large interests in the US, where they generate a substantial part of their turnover (LEB〔11〕・〔12〕).

According to a 2006 OECD study (about trends in 'foreign direct investment in OECD countries') the Netherlands ranks fourth behind the US, the UK and France and followed by Canada, Belgium and Germany. In terms of direct investments abroad the

Netherlands also ranks in the top five behind the US, Japan, the UK and France.

Private equity funds

Financial transactions in the food industry related to the acquisition of share capital increasingly involve private equity funds or venture capital companies, which utilize capital (mostly from pension funds, insurers and banks) to finance promising activities of non-listed companies, with the objective of selling these for a profit after a number of years. At the end of 2005, Dutch private equity funds had invested 13,500 million Euros in 1,200 companies, including 1,000 companies in the Netherlands. Several foreign-owned private equity funds are also active in the Netherlands. In 2006, venture capital companies realized take-overs in the Netherlands to the value of more than 25,000 million Euros, including in the food industry (LEB [10]).

Trends in development

Table 4, at the end of this section, presents a concise historical overview of the economic trends within the FBT industry. It shows that the contribution that the sector makes to the national income has decreased somewhat: from 3.4% in 1987 to 2.5% in 2005. This can give a misleading impression of it being a 'sunset industry', a sector in decline. However, these data are strongly influenced by the steep growth in the total economy (including the service industry). During the same period, the sector's contribution to the economy (gross value added) in nominal euros almost doubled from 6,800 million to 12,100 million. The contribution of the FBT industry to gross value added increased from 21% to 25%, indicating that other sectors are in decline or are relocating abroad far more than the FBT industry. In other words, the Dutch FBT

Table 4 Retrospective Overview of the Dutch FBT Industry

(Some key statistics for the Dutch FBT industry, 1987-2005)

	1987	1990	1993	1996	2005
Number of companies [a]	885	875	914	881	215 [b]
% of the total industrial sector	15.80%	14.20%	13.70%	14.20%	10.00%
Number of employees	125,973	125,449	124,806	112,329	86,200
% of the total industrial sector	16.70%	16.00%	17.20%	16.90%	18.00%
Industrial sales (euros)	28,762	31,287	33,982	31,765	54,700
% of the total industrial sector	27.40%	25.30%	29.20%	-	21.75
Gross value added (euros)	6,789	7,755	8,725	9,448	12,100
% of the total industrial sector	21.10%	20.80%	23.30%	22.70%	25.30%
Contribution to GDP (%)	3.40%	3.30%	3.30%	3.20%	2.50%

Source: Landlbouw-Economisch Bericht 1996.

Note: a) Companies with 20 or more employees

b) For 2005: more than 100 employees (for this category, the FBT industry contributes 17% to the industry)

sector continues to be capable of drawing labor and capital.

3. The competitiveness and innovation of the Dutch FBT industry

Several sectors of the Dutch FBT industry hold an important position in the world export market. An earlier study (Jacobs & Lankhuizen, 2005) showed that, of the 100 Dutch industrial product groups that make the largest contribution to the world export market no less than 51 belong to the agri-complex. This situation has remained virtually unchanged since 1986. In this section we first will briefly discuss the competitiveness of the European FBT industry and then turn to discuss the Dutch contribution to international markets in more detail.

The European FBT industry

Since 2008 the competitiveness of the European food industry has become an important theme on the agenda of the European Commission, which has established a 'High Level Group on the Competitiveness of the Agro-Food Industry' (HLG). This group consists of European Commissioners, ministers from various countries, CEOs of several companies and NGO representatives. Recently, this group has produced 30 recommendations for improving competitiveness. These cover various domains including agricultural and environmental policy, the internal market, chain performance, research and innovation and how to stimulate trade and exports. Here we discuss several of these recommendations. The HLG emphasizes the importance of a market-oriented agricultural policy. This is understandable in view of the fact that raw material prices have a great impact on the processing industry's competitiveness. Also, in view of the larger fluctuations of raw material prices, the HLG calls for consideration to be given to new policy instruments in order to control price risks. They also argue that the internal market can be strengthened by an improved interpretation and implementation of food legislation. Research indicates that there is still considerable room for improvement in this field (Wijnands et al. [18] , Poppe et al. [14]).

European food legislation has been tightened sharply, after several food-scares, notably over dioxin and BSE, in order to restore consumer confidence in the safety of food products. Although the industry assessed these changes positively, the legislation is viewed as being too complicated, resulting in a high administrative burden. Public inspectors and private labeling schemes, such as Global GAP, could be helpful,

particularly in supporting small companies, but this happens too rarely. However, it is not all trouble and affliction: although traditional products are seen as being at a disadvantage by new EU hygiene legislation, this appears to be due to misconceptions amongst national authorities and producers.

"Legislation is seen as too complicated, resulting in a high administrative burden ..."

Research within the dairy industry sector indicates that current legislation (HACCP system) has mostly stimulated process, rather than product innovations (Bremmers et al. [14]). Companies that are active in product renewal are particularly dissatisfied as they feel that too much time is needed for acquiring authorization; that procedures are not transparent; and that the costs are too high. Moreover, a study by LEI and Wageningen University shows that food safety systems and quality control in dairy companies (and probably in the entire food industry) are implemented more in response to the requirements of consumers and supermarkets than they are driven by legislation. The costs should not, therefore be seen as an administrative burden, because they would also have to be (at least partly) made without the existing legislative requirements. Furthermore, many innovations in the dairy industry originate from suppliers including the packaging industry (such as Tetrapak) and ingredient suppliers (such as Demand Size Management/DSM) (Poppe et al. [15]). Official statistics do not offer good insights into the extent of innovation in the dairy industry and, some companies can be successful without much innovation by, for instance, making use of a cost-price leadership strategy. From publications in professional journals it can be deduced that Arla and Danone rank as two of the most innovative companies in the dairy industry. Campina (now part of FrieslandCampina) is ranked in the top ten as well.

The Dutch FBT industry

The Dutch FBT industry ranks well on competitiveness in comparison with the main EU-15 players, the US, Canada, Australia and Brazil. Within Europe (see figure below) countries such as Spain, Hungary and Poland and some smaller member countries have fared better than the Netherlands in the past decade, due to several macro-economic factors. Italy's competitiveness is on par with the Netherlands, while Denmark's

performance is somewhat lower.

The success of the Netherlands is particularly based on the growth of labor productivity, growth of added value and the contribution of value added by the food processing industry to the total industrial sector. Nevertheless, the export share of the Netherlands is decreasing.

Larger countries such as Germany and France have performed particularly poorly.

The loss of export market share is particularly marked in France. In Germany, slow growth in labor productivity and added value are responsible for its poor position. Both countries are traditionally very involved in processing products that have traditionally been the focus of the EU's Common Agricultural Policy/CAP (such as milk powder and sugar) and also face a relatively poorly-performing labor market (with a high percentage of structural unemployment).

Sub-sectors

Analysis of the competitiveness of various sub-sectors of the Dutch FBT industry indicates that some show negative trends (LEB [10]). Assessment shows that the fish-processing industry has become weaker, having experienced a relatively steep decline in its share of the overall food industry. It is facing a strong on-going internationalization and many labor-intensive activities are now carried out in low-wage countries. At the same time the supply of Dutch fish is decreasing.

The dairy and the margarine, fats and oils sectors are both assessed as having become weaker due to losing share in the world market, which is largely due to WTO arrangements on agricultural policy. Any growth in the European dairy sector, including the Dutch dairy sector, is hampered by dairy quotas. In the margarine, fats and oils sector processing consists of several steps: crushing to obtain raw oil, refining the oil and manufacturing consumer goods, such as margarine and dressings. For economic reasons, the first and second steps are increasingly being carried out by the producing countries themselves. Indonesia has experienced a substantial growth in the production and export of palm oil, and Brazil of soybeans and soy oil. European export shares in this sector decreased steeply between 1996 and 2004.

Comments on the financial crisis of 2008-10:

The collapse of the American housing and mortgage markets in 2008, created an enormous financial crisis for the entire world economy, which subsequently turned into

an economic crisis, and, in some countries, has even led to an economic recession. Many banks forecast negative growth figures for 2009 and Dutch banks (on average) did not expect any growth in 2010 (ABN AMRO [2]).

According to the annual report of UNCTAD on trends in investments, the financial crisis and the economic recession have had a negative impact on direct investments in the Dutch economy and in developed countries as a whole (EVD [7]). Besides covering investment trends, 'The World Investment Report 2009' also pays particular attention to agricultural production and development and to the role of multinationals / transnational enterprises (EVD [7]).

Traditionally, the FBT industry is less sensitive than other industries to economic fluctuations. This explains why the average daily turnover of the FBT industry shows relatively less downturns during years of crisis than other sectors of Dutch industry (CBS [5]). People still continue to eat and drink during adverse economic times and in such times people are slow to cut back on their expenditure on food, beverages and tobacco (ABN AMRO [1]).

A CBS consumer survey from 2003 shows that, regardless of the economic situation, only 7 % of a sample of interviewees would save on food products and tobacco if their incomes drop. Data for this consumer survey were collected during a period of 15 years (between 1988 and 2003).

"The financial crisis has caused less damage to the Dutch FBT industry than to other sectors and branches of industry ..."

Obviously, there are a number of factors at play: an increase in inflation, stagnation in credit supply by financial institutions and decreasing investment, decreasing consumption and world trade/export. Together, these factors certainly have their influence on the Dutch FBT industry. For instance, the Russian flower market was lost as the crisis had more serious consequences in Russia. Within the FBT sector the financial crisis certainly has not passed unnoticed, but brought less damage than it did to other branches of industry and sectors of Dutch (and global) economy (de Bont [4]).

Employment and the labor market

Currently, general attention focused on controlling the financial crisis. However, in

the near future the FBT industry will be facing an imminent crisis with a potentially much larger impact: a labor market crisis. Research from the recruitment and posting bureau YER and the Intelligence Group shows that due to retirement of the 'baby boom generation' (people born between 1945 and 1955) within a few years there will a big demand for young, well-skilled employees. Between 2007 and 2013, one in five Dutch people will leave the labor market (Carp [6]). There will also be shortage of highly-educated professionals, which will particularly affect sectors requiring technical professionals (including the FBT industry), the care sector and higher business services, where the labor shortage will be the largest (Carp [6]). The inflow of new employees is a problematic issue and the issues of 'employment and labor market' require strategic attention from the FBT industry itself, the Dutch government and other authorities.

Innovative power

Compared to competitors from other EU-member countries, the Dutch FBT industry spends relatively more on R&D (Wijnands et al. [18]). Dutch SMEs in the FBT industry also rank above average for innovation (ABN AMRO [1]). Innovation is considered to be: "something new for the setting in which it will be introduced, aimed at achieving certain advantages, limited to purposeful efforts to gain benefits from change" (Van Galen and Verstegen [9]). A wide variety of forms of innovation exists within the FBT industry, which can be distinguished as product, process and transaction innovations (Jacobs et al. [16]). Some examples are:

- product innovation: new flower and potato species, new vaccines, new beer types and new types of packaging for beer (e.g. home kegs);
- process innovation: quality control for flowers, increasingly efficient flower auctions and logistics, new production practices for mussels;
- transaction innovation: marketing in the beer sector, mediation at auctions, franchising in pig husbandry.

Several factors explain the innovative force of the Dutch FBT industry (see figure 2). First of all, Dutch companies are characterized by dynamic entrepreneurship: i.e. entrepreneurs are alert and not easily discouraged (Jacobs et al. [16]). The European FINE (Food Innovation Network Europe) project (see Poppe et al. [15]) indicated intense exchange between Dutch (agricultural) knowledge institutions and private

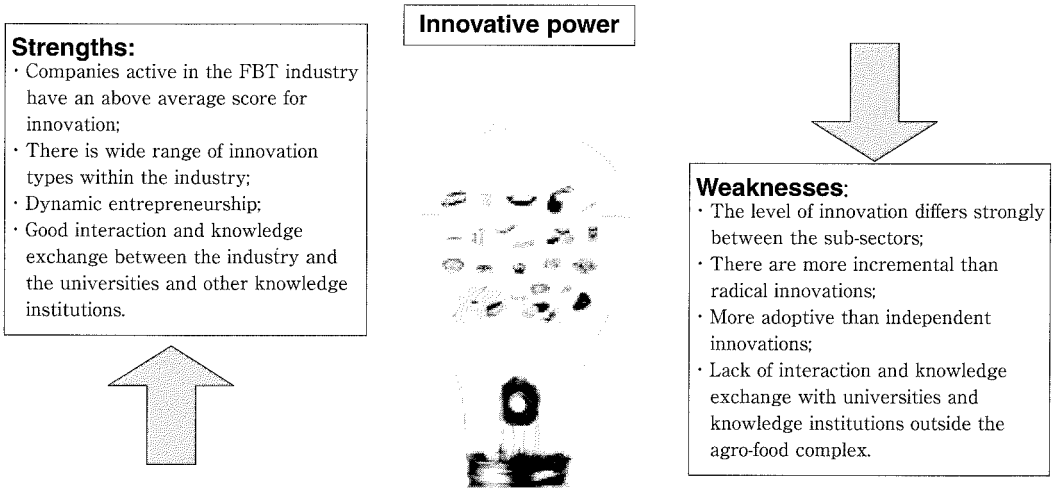

Figure 2 The Innovative Force of the Dutch FBT Industry

enterprise, observing that companies made relatively greater use of knowledge institutions. Finally, regional clusters exist which act as mediators between FBT companies, knowledge centers and policy makers (Poppe et al. [15]), facilitating the exchange of knowledge and skills within the cluster.

However, this image of a powerful innovative sector needs some nuancing.

1) The extent of innovation differs strongly between sub-sectors (Jacobs et al. [16]). For instance, the dairy industry is considered innovative while the fishing sector has shown less innovation (at least until the Innovation Platform for Fishery was put in place).
2) Within the FBT industry innovation tends to be incremental rather than radical, and many researchers and reports speak of limited innovation within this industry. "A comparison, conducted by Ernst & Young and Nielsen (2000), of innovations within 22 food product groups shows that only 2% of all launched products can be considered as real innovations. Other innovations often were complements to existing products, line extensions, replacements for existing products or seasonal products. According to more recent research the sector itself estimates that about 75% of implemented innovations can be considered 'small adjustments' and that for the years to come about only 5% of all innovations might be called truly pioneering" (ABN AMRO [2]).
3) The higher extent of adoptive innovation, compared to autonomous innovation,

results in less added value being created for the customer (Jacobs et al. [16]). Companies respond to their close competitors and the innovations they make. A recent study by the Food Innovation Network Europe characterized the majority of innovations (77%) as 'me-too' product innovations. These are products that are essentially the same as other existing products, marketed under a new brand name. Other types of new products are assortment extensions (new products within the same product category), seasonal products (e.g. Easter eggs) and replacement products (introduction of already existing products that do not add any new value for the customer) (Vermeire et al. [17]).

There are a number of possible reasons for the relatively high occurrence of adoptive innovation.

1) Much innovation is initiated outside of the industry, for instance by the government (Jacobs et al. [16]), which opens funds for research, hands out 'innovation vouchers' or implements certain policies or legislation that force companies to innovate.
2) Process innovations often fail to be successful or new products launched on the market are classified within the FBT industry. This means that innovations are often accompanied by unfavorable financial conditions/cost-effectiveness (ABN AMRO [1]), which leads business and industry to display risk-avoiding behavior with regard to innovation.
3) There is a lack of interaction with knowledge institutions outside of the agri-complex (Jacobs et al. [16]). This implies a tendency to build on known elements within the complex, and makes it more difficult to find new insights. Broader cooperation might give rise to new insights and interactive learning moments for both the FBT industry and new parties from outside the agri-complex.

4. Conclusions

The FBT Industry is an important part of Dutch industry and makes a large contribution to Dutch exports. It is an essential part of the agri-complex, which accounts for approximately 10% of the Dutch economy, being a stable economic factor. An important part of the sector is based on foreign raw materials, which are processed in the Netherlands for European consumers. Another part of the sector adds value to

Dutch agricultural produce. The important role of raw foreign materials is strongly related to the main ports, particularly the harbor of Rotterdam.

Competitiveness is relatively strong:

- The Dutch FBT industry has a strong position in export markets abroad, which is positive in a continually globalizing economy.
- Knowledge and innovation capacity are well maintained by the presence of powerful knowledge institutions (such as Wageningen UR) and successful cooperation between knowledge institutes and companies (often working in clusters).
- Dynamic entrepreneurship: Dutch entrepreneurs respond well to new developments and are apt at identifying market opportunities.
- Opportunities can be found to further develop the competitiveness of the Dutch FBT industry through making use of innovation and of the consumer market's heterogeneity. It may be useful, then, to pay more attention to autonomy rather than to follow-up innovations, to cost-effectiveness of R&D and to interaction with non-agri knowledge institutions (such as design, packaging industry, ICT, etcetera).

However, maintaining and/or reinforcing competitiveness will involve paying attention to several points in the future:

- The FBT industry focuses traditionally on controlling cost price, often through scaling-up and consolidation. In the retail sector and supply industries, such as seed improvement, attention is also paid to value added through product innovation for target groups. These two links in the chain can jointly realize further innovations thereby creating pressure on margins in the FBT industry.
- Internationalization raises the question of which elements of the chain are particularly bound to the Netherlands and which will feel more at home in other parts of the EU (or beyond).
- Due to demographic developments, the labor market is getting tighter.
- New innovations from ICT, biotechnology and nanotechnology are emerging.
- The power in global food chains is shifting from producers to retail and from government to private enterprise. This has implications for the private sector assuming new responsibilities in fields such as sustainability and health.

Notes:

1) Several names are used to refer to this industry: food sector, food industry, etc. Since these names all refer to the same branch, we use the practical abbreviation FBT (food, beverage and tobacco industry = Dutch *voedings-en genotsmiddelenindustrie*). The Dutch statistics generally has the classification of food, beverage and tobacco industry. The tobacco industry is positioned as an important section in Dutch agrifood industry.

2) As a literature review this paper draws on, several indicators that are widely used in this paper to illustrate the sector's volume: number of companies, employment, production value (roughly equivalent to total turnover), and (gross) value added (turnover minus purchases of materials and capital goods, i.e. the income remaining for all labor and capital employed).

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