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Abstract

This study investigates the strategic behaviour of food industry firms. Its two goals are to:
(i) characterise strategies being employed; and
(ii) identify distinct approaches to information-sharing

Data from an interview-format survey of Danish food industry firms are used to characterise strategy at two levels: 11 "strategic orientations"; each of which is composed of 3-6 of a total 57 "strategic actions". Principal components were identified and two complementary cluster analysis techniques were used to assemble clusters that are composed of firms either with distinct strategies, or sets of strategies occurring in distinct combinations.

Eight clusters emerge, with reasonable procedural performance. The clusters are distinct in a surprisingly large number of ways, including their strategies for market share, pricing, approach and response to regulation, exports and use of retailers' own-label brands. Information-sharing strategies are closely linked to both marketing strategy and regulation response/anticipation.

Individual clusters identify distinct sets of behaviour regarding information-sharing up and/or down the value chain, their approach to quality and other aspects of market segmentation, targeting of export markets, and willingness to compete on price. Clusters' distinct strategies regarding regulation featured anticipation, as opposed to several diverse means of passing on compliance costs: to buyers or to sellers. Such activities were linked to information-sharing strategies in different ways by different clusters.

Danish food industry – a brief introduction

The food industry is a major industrial sector in Denmark. Though the relative share is decreasing over time around 20 per cent of total industrial turnover still comes from the food industry and that places the sector in a remarkable position seen from a global perspective.

The Danish food industry is dominated by two major branches - dairy and meat industry - which accounts for more than 50 per cent of the turnover of the sector.

The development of the industry structure has been very rapid during the latest decades. The number of firms has fallen dramatically and today only few firms have survived. The result has been increasing concentration ratios in almost all groups of the food industries.

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The export orientation has been high for many years – almost back to the beginning of the 20th century. In general, about 60-70 per cent of agricultural production is exported. Diversification of export markets and export to far more distinct markets have characterized the development indicating a step further in the globalization process

Cooperatives play an important part in the Danish food industry. Close to 50 per cent of the turnover in the food industry comes from cooperatives owned by farmers. Vertical integration is a major driver for the existence and success of cooperatives in the sector.

The structure and the development of Danish food industry will to some degree influence the strategies formulated and chosen by the firms. As cooperatives aim at increasing farmers' production prices or reducing their input prices it is expected this may have an impact on the strategies of cooperatives.

Data and method

Survey

An interview-based survey of Danish food industry firms was conducted November – December 2005 and March - May 2006. Draft questionnaires were prepared, and repeatedly circulated to 15 organisations with an interest in food industry research and policy, during the period May-October 2005. Six food industry firms made themselves available for testing of the later drafts of the questionnaire, in many cases being the subjects of numerous mock interviews. The comments, criticisms and proposals of both stakeholders and firms were, as far as possible, incorporated into questionnaire and research design.

A team of six students were trained in all aspects of the survey from initial telephone contacts to detail of interview technique and data processing. A commercial database of contact details was purchased, with stratified sampling based on size and sector. Firms with less than five employees, and firms from several commodity sectors, were excluded. This sampling procedure yielded 986 firms, in almost every case being the total number of eligible firms, despite the stratified sample. After eliminating defunct firms, incorrect contact details, subsidiaries of other contacted firms in the sample and those firms not currently active, telephone contacts were made with 444 firms.

The survey procedure yielded 131 valid responses (a 30% response rate on 444 firms). The degree to which the survey is representative of the population of Danish food industry firms cannot be directly estimated, although table 1 below provides an overview. Eleven firms from the sectors "ingredients", "primary agriculture" and various "services" also appear in the survey dataset. These firms are classified by Statistics Denmark as being one of retailers, processors or wholesalers, but claim to operate at another stage of the chain.

The numbers of firms in the population includes firms with less than 5 employees, defunct firms, subsidiary firms and/or firms otherwise ineligible for the survey. Coverage rates range from the very low (8 unspecialised retail firms out of 3129 in the country) to quite large (3 of 8 poultry processors, 9 of 39 fruit and vegetable processors, and 17 of 61 dairy processing plants (including ice cream manufacturers)). Many of the largest and best-known of Denmark's food industry firms participated in the survey. Clearly, coverage and representative-ness are greatest amongst processing firms, although sufficient wholesale and retail firms are included to allow some inference to be drawn.

Table 1. Numbers of firms: Sample and population characteristics

	Numbers of firms							
	-- Processing --		----- Retail -----		--- Wholesale ---		----- Other -----	
Commodity sector	Popn.	Survey	Popn.	Survey	Popn.	Survey	Popn.	Survey
Feed	43		na		na			1
Fruit and vegetables	39	9	556		219	2		1
Dairy	61	17	119		130	4		2
Beef	24	5	na		na			
Pork	26	3	na		na			
Poultry	8	3	na		na	1		2
Unspecialised meat	na	10	724	8	235	6		1
Unspecialised	na	7	3129	17	241	28		4

na not available.
Source: Statistics Denmark

Survey questions regarding strategy

Firms were asked to state their strategy at two "levels" for both 2000 and 2005. The first level was characterised with 11 different "strategic orientations" (table 2):

Table 2. Categories for "strategic orientation"

Cost	
Quality	Employees
Information	Marketing
Prices	Market share
Brands	Regulation
Specialisation	Research

Firms were also given the opportunity to respond "other strategic orientation not shown here", and "this firm has no specific strategic orientation". Firms could also choose not to respond at all.

For the second level each strategic orientation was sub-divided into 4-7 categories, each corresponding to a specified "strategic action" or an alternative "other". The strategic actions associated with each strategic orientation are listed in table 3. Firms were asked to classify, again for 2000 and 2005, the strategic actions that they carried out.

Table 3. Categories for "strategic action" in each "strategic orientation"

Strategic orientation	Strategic action
Cost	"Low cost due to large scale" "Low cost due to high capacity utilization" "Low cost due to advanced technology" "Low cost due to management skills" "Low cost raw materials" "Low cost due to investments/activities" "Other cost strategies"
Quality	"Delivering higher quality than any competitor's" "Offering a range of qualities" "Focused on a specific quality level" "Other quality strategies"
Information	"A focus on information-sharing with suppliers" "A focus on information-sharing with buyers" "Internal information systems focused on buyer requirements" "Internal information systems focused on performance" "Other information strategies"
Prices	"Selling at lower prices than the competition" "Generally following the lead of other firms in setting prices" "Price levels that reflect the entire product range sold to each buyer" "Somewhat high prices that reflect convenience, quality and service" "Other price strategies"
Brands	"An active system for new brand introductions" "Purchase, management and sale of brands" "Specialisation with in retailers' own label brands" "A core of established brands with few introductions and withdrawals" "Other brand strategies"
Specialisation	"Specialisation in a few products" "Specialisation in a few markets" "Specialisation in a narrow area of staff skills" "Specialisation based on a specifik raw material" "Specialisation in organic products" "Other specialisation strategies"
Employees	"A large investment in training" "Providing better working conditions than those of our competitors" "Replacing low-skilled labour with technology" "Replacing low-skilled labour with out-sourcing of tasks"

Table 3. Continued

Marketing	"Increasing sales volumes" "Adding more value to existing sales volumes" "Attracting new consumers/buyers" "Building loyalty amongst existing consumers/buyers" "Other marketing strategies"
Market share	"Growth in market share by merger and acquisition" "Growth in market share by pricing behavior" "Growth in market share by non-price competition (e.g. advertising and promotion)" "Growth in market share maintaining close relationships to buyers" "Other market share strategies"
Regulation	"Avoiding heavily-regulated products, processes and markets" "Anticipating regulation" "Shifting costs of regulation to suppliers" "Passing on costs to buyers" "Other regulation strategies"
Research	"Research into final consumers' preferences" "Research into buyers needs" "Research into competitors' product lines" "Research into technology and costs" "Research into new product development" "Other research strategies"

Survey results

Almost all firms (93%) claim to have a strategic orientation for “quality” and 84 % for “cost”. The least popular strategic orientation is “research and development” (37% of all firms).

When examined by sector (table 4) few obvious patterns emerge. Notably, a majority of firms in the fruit and vegetables sector claim “research” as a strategic orientation, and rather few poultry firms (33%) claim a strategic focus on “marketing”.

Table 4. Strategic orientation by sector

Percent of firms in sector with this strategy in 2005	Cost	Quality	Information	Prices	Brands	Specialisation	Employees	Marketing	Market share	Regulation	Research
1. Fruit and vegetables	83	100	75	100	75	75	67	75	58	42	67
2. Dairy	78	96	48	96	74	83	65	70	65	61	43
3. Beef	80	100	60	80	60	80	80	40	40	60	0
4. Pork	100	100	33	67	33	67	100	100	67	33	0
5. Poultry	100	83	67	67	33	83	67	33	83	50	33
6. Unspecialised meat	80	88	56	72	68	72	68	72	52	64	32
7. Unspecialised	86	93	73	91	71	66	70	82	70	46	36
All firms	84	93	64	87	69	73	69	74	64	53	37

The lowest revenue size group has "quality" as the most popular strategic orientation, and research, market share and information as the least popular (see table 5). In general, the smaller firms are oriented to "quality" and "specialisation" to a greater degree than are larger firms. For the larger firms, "cost" and "price" are the most commonly-claimed strategic orientations. About 60-70% of firms from all size categories claim to have a strategic orientation on "brands". For small and medium-sized firms, "information" and "market share" are claimed as strategic orientations by a minority or small majority of firms.

Table 5. Strategic orientation by revenue size class

Percent of firms in size group with this strategy in 2005	Cost	Quality	Information	Prices	Brands	Specialisation	Employees	Marketing	Market share	Regulation	Research
0. No Reply	82	91	82	82	73	82	55	100	91	73	45
1. <10 million	47	93	40	73	60	87	60	67	33	60	13
2. 10-50 million	92	94	56	86	67	69	69	58	56	44	19
3. 50-250 million	85	93	65	95	70	63	70	75	65	53	45
4. 250-500 million	100	90	60	100	70	90	90	70	60	80	70
5. 500-1000 million	100	86	100	71	71	86	57	86	100	43	57
6. >1000 million	83	100	83	83	75	67	83	100	83	33	50
All firms	84	93	64	87	69	73	69	74	64	53	37

When dis-aggregated by stage of the food marketing chain (see table 6), there is surprisingly little pattern to firms' statements of strategic orientation. Firms at the "service" stage claim to pursue strategies in every category, as do almost all "ingredients" firms (with the notable exception of a strategic orientation on "brands"). The most popular orientations for processing and wholesale firms are quality, costs and price: wholesale firms appear to put greater emphasis on "cost" and "information" than do processing firms. "Research" is again the least popular strategic orientation across all stages of the chain. There appears to be substantial variation across stages of the chain in the emphasis given to strategies concerning "employees".

Table 6. Strategic orientation by stage in the food marketing chain

Percent of firms in stage with this strategy in 2005	Cost	Quality	Information	Prices	Brands	Specialisation	Employees	Marketing	Market share	Regulation	Research
1. Primary	75	75	25	75	25	75	25	0	50	25	25
2. Service	100	100	100	100	100	100	100	100	100	100	100
3. Processing	83	94	54	83	72	76	69	76	63	56	44
4. Wholesale	90	90	74	90	72	72	64	79	69	56	38
5. Retail	74	100	67	89	67	63	78	70	52	37	11
6. Ingredients	100	80	100	100	40	80	100	80	100	80	80
All firms	84	93	64	87	69	73	69	74	64	53	37

A closer examination of the survey results is occasioned by the firms' responses about their strategic actions: the "second level" referred to above. To best present this data, firms' responses are categorized. Initial draft versions of the survey questionnaire had invited firms to assign scores or rankings to strategic orientations or strategic actions. However, in test interviews

firms declined to use a Likert scale and simpler versions of it. As a consequence, use or non-use of strategies was recorded by simple "yes" and "no" answers. The two years of data were then combined to generate a record of whether firms had, or had not, applied a nominated strategic orientation (at the first level) or implemented a specific strategic action (at the second level).

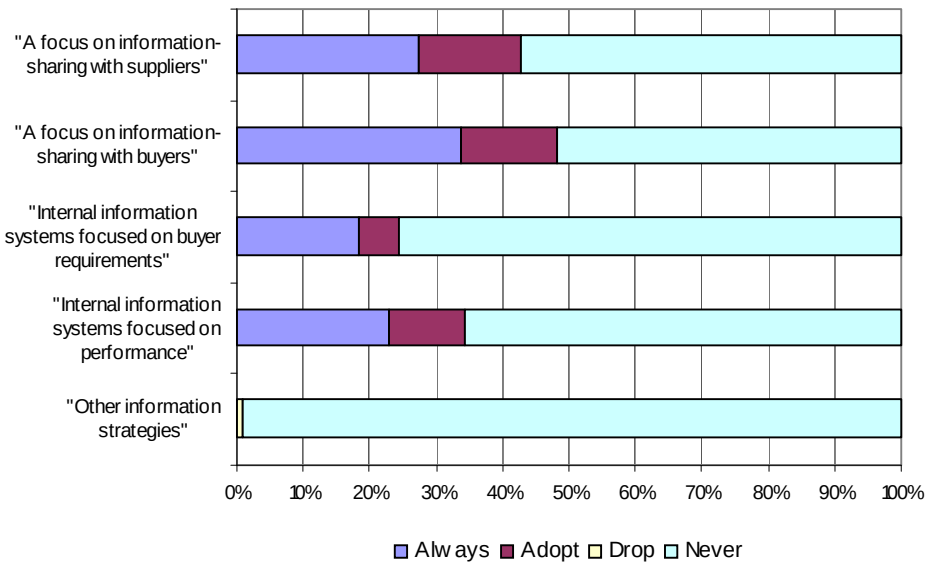
The resulting classification is "Always", "Adopt", "Drop" and "Never" indicating whether a strategy was pursued in the entire period 2000-2005, adopted or dropped between the two years, or was never followed as a strategy during the period (see table 7). These classifications are used to generate scores for the clustering procedures.

Table 7. Categorization of strategies

Category	Interpretation
Always	The strategy was employed in both 2000 and 2005
Adopt	The strategy was adopted between 2000 and 2005
Drop	The strategy was dropped between 2000 and 2005
Never	The strategy was employed in neither 2000 nor 2005

Around 15-20% of firms have adopted strategies associated with generation of information with trading partners in the supply chain (figure 1). It is notable that there is a clear difference between the proportion of firms sharing information and the proportion using internal information to satisfy buyer requirements. Surprisingly, only about 35% of firms claim to have emphasised information systems focused on performance measurement, and of this number just 8% have adopted this practice between 2000 and 2005.

Figure 1. Information strategies



Clusters delivered

The cluster analysis yielded 8 clusters (cluster 5 omitted)

1. "Small, buyer oriented, local specialisations"
2. "Small, price followers, high value"
3. "Price discriminators, range of markets, research-oriented"
4. "Large, unspecialised, price discriminators"
6. "Domestic market, high quality, customer loyalty"
7. "All things to all people"
8. "Small, price discriminators, little information exchange"

Table 8. Cluster characteristics

Cluster	General descripton	Characteristics of firms in the cluster
1	• Small, one-man firms • Unspecialised food processors	• Smallest firms (sales and employees) • Low sales per employee • Fewest employees with university degree • High sales of brands owned by the firm
2	• Private companies and co-operatives • Dairy and unspecialised food processors	• Second smallest firms • Highest sales per employee • Highest percentage of employees with university degree
3	• Private companies • Unspecialised food processors • All sizes of firm	• Average-high sales • Large number of employees • Highly export-oriented • Highest percentage of sales from retailers' own-label brand
4	• Large firms • All business forms • All stages of chain • Unspecialised, unspecialised meat	• Average-high sales • High sales per employee • High percentage of sales from retailers' own-label brand • Large number of corporate brands
6	• Average sized firms • All business forms • All stages of chain • Unspecialised	• Highest number of new products • Lowest percentage of exports
7	• Large firms • Processing, wholesale and service • Dairy, unspecialised and unspecialised meat	• Largest firms • Highest percentage of exports • 2-9 products per brand • High expenditure on new product introduction • Most time spent on market research • Slow new product introduction
8	• Small private firms • All stage of chain • Dairy, unspecialised, unspecialised meat	• Low-average sales • High sales per employee • Few new products • High percentage of sales from retailers' own-label brands • Few employees with university degree

In table 8, it is apparent that clusters 1,2 and 8 comprise the small firms, with the largest being in clusters 3, 4 and 7. Cluster 6's members have an average size near to the average for the whole dataset. Clusters 3, 4 and 6 include a wide range of sizes of firm. Unspecialised firms are found in all clusters, and indeed there is little evidence of commodity specialisation in any cluster. Food processors dominate clusters 1, 2 and 3, while most clusters feature retail members (only cluster 7 excludes retailers). There is little apparent association between the business form adopted and cluster membership, although 1, 2 and 8 feature private companies and some co-operatives. Notably, no cluster features a strong co-operative dominance.

Table 9 presents the % of firms in each cluster that claim each of the 11 strategic orientations addressed in the survey. In general, most firms claim most strategic orientations, with cluster 7 being an extreme case (almost all firms' claims to have followed almost all strategic orientations). Amongst strategic orientations, "regulation" and "research" feature very few firms from clusters 2 and 4. Amongst clusters, 2 and 4 show the greatest degree of discrimination. These two clusters appear to have few structural characteristics in common.

Table 9. Strategic orientation by cluster

Strategic orientation by cluster	Cost	Quality	Information	Prices	Brands	Specialisation	Employees	Marketing	Market share	Regulation	Research
1	80%	93%	80%	93%	87%	93%	80%	73%	60%	93%	33%
2	68%	86%	32%	70%	46%	73%	32%	38%	27%	14%	11%
3	100%	100%	78%	89%	100%	89%	89%	100%	89%	89%	100%
4	91%	94%	66%	91%	63%	51%	51%	97%	74%	31%	9%
5											
6	86%	95%	91%	95%	86%	77%	86%	95%	86%	86%	73%
7	100%	100%	100%	100%	100%	86%	69%	100%	100%	100%	100%
8	100%	100%	60%	100%	40%	80%	80%	20%	80%	100%	80%

The most extreme cases of adoption of strategies between 2000 and 2005 was in "information"-related strategy. Between 10 and 20% of firms adopted information sharing with each of buyers and suppliers in that period. Subsequent investigation showed that few firms shared information in both "directions". Information sharing in the chain was, in 2005, a more popular strategic action than was the generation of performance-related information for use inside the firm.

The clusters display a range of information-exchange strategies, which mostly relates to marketing activities such as the strategy pursued with buyers and suppliers. However, the current study's clusters are highly differentiated both by the extent and direction of information exchanges and the apparent purposes to which it is put. Cluster 3 (medium sized firms, highly export-oriented, substantial use of retailers' own-label brands) defines no clear approach to customer loyalty but shares information both up and down the marketing chain. Cluster 4 (large firms) also serves an array of market types and also shares information with both customers and buyers. Cluster 6 (large firms focused on the domestic market) emphasises information exchange with buyers, but not with suppliers. Clusters 1 and 8, both composed of small firms, have very different information exchange strategies: cluster 8 exchanges little information in the chain.

References

Baker, D.; Kimmie Graber-Lützhøft and Kim Martin Lind (2007) “Strategy amongst food industry firms – A cluster analysis of results of a Danish survey, and comparisons with classical models of strategy”, FOI, Report no. 190