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The system of deep frozen food technologies is a central innovation in the post WW2 system of food provision. The key innovation, pre-packaged deep frozen food for consumers was introduced in Sweden in 1945-47, while a breakthrough could have been said to have taken place in the mid-1950s. By the late 1950s Sweden was the fourth largest consumer in world with c. 15,000 tons while being second largest concerning consumption per capita after the US.

The aim of this study is to focus on the discourse concerning frozen goods and equipment manifested in a selection of trade journals. I use journals from three Swedish grocery businesses (The Swedish Co-operative union, the ICA-sphere and the ASK company) and from three business associations (the Federation of Swedish Merchants [mostly retailers], the Federation of Swedish Grocers and the Federation of the Swedish Fish Trade). In these journals I will study articles and advertising related to deep frozen foods and equipment during the period 1945-1960. Three overall questions are explored; who was it that produced the knowledge and arguments concerning frozen food, which arguments were used and finally what kind of message (both regarding texts and images) did advertisements in the journals convey?

Both grocery businesses and business associations are studied since the motives for and true interest in introducing frozen food could differ. While the grocery trade had an interest to increase sales by new goods, the business associations may have been more reluctant to support the new technology since it was a costly process for the retailers. The fish trade was a special case since the selling of frozen fish in general grocery stores would compete directly with fishmongers. However, since previous studies have shown that Swedish retail business associations in general was positive towards innovation and rationalisation, the reluctance on the part of the business associations to take on the frozen food technology would be relative rather than absolute. The three chose grocery businesses comprised a major share of Swedish grocery wholesaling and thus indirectly retailing. Their degree of hierarchical integration differed, however. None of them were fully vertically integrated in the studied period. The Co-operative union was the most centralised, but the grocery units were not formally owned by the central organisation. The ICA-sphere was, during this period, a retail owned buying group. The retailers were formally the major shareholders, but the managers of the wholesaling organisation drove the development. The ASK, finally, was a union of wholesalers with very few formal links (ownership) to their customers, the grocers. All three organisations used their power to argue and create facilities for an innovation such as frozen food, but the ultimate decision to buy freezers and market frozen good lay with the retailers.

Analytically this study draws on discussions about knowledge management and knowledge transfer such as Alexander 2005 and about the character of diffusion of an innovation such as Greenhalgh 2004.

Concerning whose knowledge that was put forward in the journals, I found that persons/experts that previous studies have shown to be important in the development of the frozen food system, was cited in or published articles in most of the journals. In the 1950s representatives from the Deep Frozen Bureau (the DF-Bureau), formed in 1953, was very active. There were, however, a number of actors not mentioned in previous research that played a major part in promoting and informing the readers about the frozen food system. Foreign expertise was also used, although most often indirectly, mostly from the US. Foreign experience did not, however, comprise the bulk of the information. There was a difference between the organisations in that the Co-Operative union to a larger extent used internal experts, while the experts used by ASK were external. Over time all organisations used the experience of retailers in order to create benchmarks for the adoption of frozen goods.

The main conclusion concerning the arguments about the frozen food system is that it was fairly easy to compile a coherent body of knowledge since the possibilities and potential problems of the
system was well known from experiences from the US, where the system had been introduced in the 1930s.

The first articles appeared in the early 1940s. The pioneers were the ICA and the ASK while the Co-Operative union did not mention frozen food until 1947. The early articles show awareness of the “freeze chain”. The main innovation was pre-packaged frozen food. An adoption of this innovation depended in turn on new methods and equipment being introduced in all stages of the chain from the production process, over storage and transportation to retailing and finally the consumer. A key factor in this development was held to be the implementation of freezing equipment in the stores. Right from the start the positive aspects of frozen food was central to the arguments: no change in taste, colour or consistency was evident, and a bridging of seasons was now possible. It was also noted that frozen food depended on a good and stable quality of the raw food material. By the late 1940s it was also highlighted that frozen foods could rationalise domestic work. Less highlighted in the early articles in the 1940s were the costs for the retailers. This question got more focus in the 1950s.

The attitude towards frozen foods was in general very positive and the expectations for a successful implementation in Sweden were high. There are some examples of criticism, which at least shows that it was possible for such opinions to be published in the journals.

By the 1950s frozen food was taken for granted. The only new argument of any importance was that frozen food was equal in price to fresh produce. The focus changed from implementation to the best way to handle and sell the goods. Journals contained almost annually articles about how to care for stock and store the goods in a way so that they would not thaw, or loose quality. There was also an increased focus on the development of freezing equipment.

Concerning, finally, advertising it was foremost freezing equipment that was advertised, consistent with the general view that this was a key factor in the implementation of the system. Frozen foods were less advertised, especially in the 1940s. Not even Findus, which advertised on a regular basis in all journals, promoted their frozen foods with any vigour in the 1940s. This changed in the 1950s, but major campaigns for frozen foods only developed from the mid-1950s.

Some preliminary conclusions from the study are that both grocery businesses and the business associations supplied members with quite detailed information on the frozen food system. The process was active and targeted and can be labelled as dissemination. It is evident that Sweden could build on previous experiences, especially from the US. Critique or scepticism was rare, but existed. Informants were on the one hand external experts who supplied information to most relevant actors in the sector, but internal experts were increasingly used. The more centralised Co-Operative union was not more active or positive in promoting frozen foods. The business associations were also in general promoting the frozen food system. During the first decade of dissemination, c. 1942-1952, grocery businesses and business associations played an important role in supplying information. After the DF-bureau was formed in 1953 they became an important source of information, but the early diffusion or dissemination did not depend of them, for obvious reasons. Even though the journals supplied much information it could be noted that they did not really understand the speed with what freezing equipment was developed. An effect was that retailers who had taken advice to buy small closed boxes in the late 1940s made a bad investment, since large open cabinets were introduced in the early 1950s.

A more general conclusion is that similar to the adoption of self-service in Sweden, there was a broad interest to implement an important innovation. The arguments and advertising in the journals supported the transfer of knowledge about the deep frozen food system. Continuous organizational learning was important. Compared to the US development in the 1940s and 1950s the introduction of frozen foods in Sweden was from the start directed towards a mass market and frozen foods were not conceived of as a luxury.

Selected references
Bäck, L. (1972), Konsumtionsutvecklingen för djupfrysta livsmedel, Uppsala.
Bäck, L. (1975b), *Studies on the development of consumption and market structure for quick frozen foods*, Uppsala.


