

# Stimulating entrepreneurship - The impact of a new way of organizing dairy farmers

Henri Holster<sup>a</sup>, Laurens Klerkx<sup>b</sup>, Boelie Elzen<sup>a</sup>

<sup>a</sup>Wageningen UR, Animal Sciences Group, Wageningen, The Netherlands; <sup>b</sup>Wageningen University, Department of Social Sciences, Communication and Innovation Studies, The Netherlands - [henri.holster@wur.nl](mailto:henri.holster@wur.nl)

**Abstract:** *The Dutch Dairy Farming Academy (DFA) seeks to empower Dutch dairy farmers in a renewing knowledge system. The project was started in 2005 and funded from a combination of public and private sources. It is an ongoing activity that has recently received funding to continue up until 2010. The long-term goal is that it will fund itself from membership fees from associated farmers. The main objective of the DFA is to stimulate learning between farmers. To this end, DFA acts as a facilitator in a process of inter-firm networking between farmers and, by doing so, it acts as a network broker or change agent in the knowledge system.*

*This paper is based on monitoring & evaluation (M&E) activities that have become an integral part of the DFA in 2008. Hence, the M&E has been running for about a year while the DFA is an ongoing activity. This means that in this paper we can only present some preliminary results that are partly intended to define our M&E research and activities for the period ahead.*

*In this paper we will analyse to what extent DFA is achieving its objectives. We will focus on the micro-level where we will explore whether the DFA has stimulated farmer-members of the academy in a changing environment to act different from what they used to do. In further work we will also address the macro level (the knowledge system) where we will explore whether other actors and organizations change their way of interacting in the system.*

*The M&E activities included a desk study on network broking in general and on the goals and results of the DFA. This has been supplemented with fieldwork in which M&E was carried out by the authors on the output, outcome and, to a minor extent, on the impact of the DFA. The M&E methodology used is explained and the results of what can be seen as effects of the DFA on farmers will be discussed. We have used a so-called "result oriented" M&E approach by interviewing DFA members on how they experienced the activities of the DFA. We have done so through a telephony survey which constituted the first step of this research. Doing so allowed us to analyse micro level research objective mentioned above. This year (and possibly also in later years) we will tackle the macro level issues (the impact of DFA on the whole knowledge environment).*

*This paper is partly based on, and builds further on earlier research on the DFA, documented by Klerkx and Leeuwis in the paper "Emergency of network brokers for enterprise development in agriculture and their embedding in the broader innovation support system" (Klerkx and Leeuwis, 2007).*

**Keywords:** *Dairy Farming Academy, entrepreneurship, renewing knowledgesystem, monitoring and evaluation methodology, network broker, system innovation, results of the DFA*

## Introduction & context

In recent years, the world of dairy farmers has started to change enormously. During the final decades of the last century it used to be a rather stable system but many changes have occurred since and farmers face a future with many uncertainties. A major shift has taken place from productionist agriculture under a protectionist economic regime to multifunctional agriculture in an open economy (Hendrikse and Bijman, 2002; Reardon et al, 2003; Zilbermann et al, 1998). This was accompanied by challenges as having to operate in liberalized global markets and having to deal with a variety of societal requirements regarding product quality, ecological and social sustainability, animal welfare, and food safety (Bonny, 1998; De Wilt et al, 2001; Zilbermann et al, 1998). To tackle these challenges, many developed countries have sought to stimulate entrepreneurship among farmers (Knudson et al, 2005; Lans et al, 2004). Farmers are encouraged to be more market oriented, to seek new opportunities, and to act in a more strategic manner (Phillipson et al, 2004). This shift from a

production emphasis to a business and market driven economy has forced farmers to develop generic business skills rather than (only) technical skills and production knowledge.

Acting more strategically and learning new skills in a changing knowledge system is new for many farmers which has proven to be quite difficult for many of them. Various governments have started facilitating programs to enhance farmers' entrepreneurial and innovative capacities (Phillipson et al., 2004). These authors describe three models of agricultural enterprise development. The first model is commonly referred to as 'agricultural extension', which nowadays in the context of Western European Countries often takes place on a market through which technical and economic advice is provided by private consultants (Feder et al., 2001). The second model is the 'full integration model' which deals with the provision of generic business support services to farms so that farms are treated like other (rural) firms who are provided with the same kind of services. The third model is the 'intermediate model' and involves an intermediary agency acting as a bridge, or a broker, between farms and generic support providers.

Phillipson et al, (2004) argue that for the present context of 'entrepreneurial' farming, the intermediate model is the one most suitable. Traditional advisory services are not suited to provide generic business support to farms, and the full integration model does not take account of the unfamiliarity of suppliers of non-agricultural support services and farmers in dealing with one another. Intermediary enterprise development programs are often policy initiated and publicly funded. Public funding for intermediary organizations is generally justified on the basis of market failure arguments (Curran and Storey, 2002; Phillipson et al, 2004:). Network brokers, whose aim is to facilitate inter-firm networking for the purpose of information interchange and joint learning, are one manifestation of the intermediate model, but instead of linking farmers with support service providers, they link farmers with each other.

Historically, agricultural research and extension were assumed to be the prime sources of information to farmers (Leeuwis and van den Ban, 2004). Until 1990, before privatizing extension services and research, the agricultural knowledge system in The Netherlands was based upon strong cooperation between Education ("Onderwijs"), Extension ("Voorlichting") and Research ("Onderzoek"). This system is known worldwide as the successful "OVO-drieluik" (OVO-triptych). However, due to the shift towards a much more market based system (through privatizing) various market failures and system failures occurred. This resulted in disintegration of the knowledge distribution system and a lack of throughput of knowledge towards farmers (Leeuwis, 2000).

One way to tackle these market and system failure is via brokered network initiatives. The Dairy Farming Academy is considered to be such a network broker.

## **The Dutch Dairy Farming Academy (DFA) as network broker**

Learning networks of farmers have existed in the Netherlands for a long time and are commonly referred to as study clubs. These learning structures consist of informal networks of farmers, often supported by an external facilitator. There are also formal networks, externally driven study clubs which are mostly initiated by governmental initiatives. This type of study club usually has a limited lifespan (Guijt and Proost, 2002).

Due to changes in the agricultural sector, however, and the business and innovation support structure, the effectiveness of traditional study clubs has become exposed to a variety of pressures like:

1. The agricultural sector has become more heterogeneous, due to reduction of numbers of farmers and differentiation. As a result, the demand for knowledge and information has also become more heterogeneous (Janssen and Braunschweig, 2003). This makes it increasingly difficult to set up a study club locally, based on commonalities and shared interests.
2. Due to intensifying competition, farmers are increasingly reluctant to share their knowledge freely (Nieuwenhuis, 2002).
3. Study clubs are too much based on strong ties (Gielen et al., 2003) whereas the present context of farming requires a continuous exploration of weak ties, i.e. acquiring information from new sources and combining this with existing skills and routines (Nieuwenhuis, 2002). However, as the previously mentioned constraints with regard to acquiring information and/or business and innovation support indicate, many farmers have difficulty finding their way in the 'information jungle'.

Over the past decade, in response to the market and system failures in post-privatization agricultural business and innovation support systems, and because of the new requirements regarding farmers' entrepreneurial skills, several intermediary organizations have emerged in The Netherlands (Klerkx and Leeuwis, 2008). These initiatives include network brokers and some of them are policy induced, like the Nutrient Management Support Service (Klerkx et al., 2006) and the network initiative "Networks in Animal Husbandry" (Wielinga et al., 2007).

Some other initiatives are initiated by private parties but several of these have later evolved into a concerted public-private effort, involving regional and national governments, business and innovation support service providers (R&D institutes, advisors), and farmers' organizations. Such organizations, like the Dairy Farming Academy and Horticultural Cluster Academy, aim to bring agricultural entrepreneurs together to exchange knowledge and experience at the interpersonal and group level. They organize task-specific network activities to enhance learning (such as workshops, excursions, debates, master classes). An explicit objective of these academies is to stimulate knowledge exchange amongst participants not only within their own sector (i.e. dairy farming and horticulture), but also outside these sectors, and outside agriculture. These academies thus aim to break out of strong tie networks, avoid lock-in, and stimulate new combinations (cf. Smits and Kuhlmann, 2004). Explicitly, these network brokers state that they wish to refresh and revitalize post privatization business and innovation support systems, and bring the study club concept a step further.

The Dutch Dairy Farming Academy (website: [www.melkveeacademie.nl](http://www.melkveeacademie.nl)) started in 2005 as a project joined financed by private and public means. It was initiated by the LTO melkveehouderij (Dutch farmers organization) and WUR (Wageningen University and Research Centre). A small executive group coordinates the activities and develops the DFA strategy. Governmental financing is based on the goals of facilitating entrepreneurship and changing the knowledge system 'bottom-up' with regional and national governments in a facilitating role. Private funds come mainly from the Dutch Dairy Board (PZ in a Dutch acronym: "Productschap Zuivel") which operates on behalf of the Dutch dairy sector and which is funded from farmers fees, i.e from around 21,000 Dutch dairy farmers who own 1.4 million dairy cows that produce almost 11 billion kg of milk annually. PZ funds dairy research and innovations are thus indirectly financed by farmers.

Major objectives for the DFA are to enhance entrepreneurship among farmers and to facilitate better circulation of knowledge. Farmers associated to the DFA pay a small annual fee of €105. The final goal of the public and private sponsors is to create an independent new learning environment. This could be in the form of a continuation of the DFA as a new (self-financing) institution but DFA might also be stopped if the knowledge system would alter in a way that knowledge circulation is secured by other changes. Currently, financing of the DFA as a project is secured till 2010.

During the initial years, from 2005-2007, the DFA focused especially on farmers learning from each other as shown in figure 1. As of 2008, the funding stakeholders demand that the DFA develops links with the wider knowledge system, both private (for example advisory organizations, contract research) and public (education, university research).

The DFA supports good entrepreneurship by facilitating new ways of learning between farmers on the basis of their own experience. The main slogan is "Farmers learn from farmers". More precisely, in its own basic definition, DFA aims to fulfil two functions (DFA, 2004):

1. Stimulating peer-to-peer information exchange and learning from experiences outside the dairy sector.
2. Exchange of farming practice information in various DFA forums with actors in the policy arena (government and farmers organizations), R&D and educational institutes, to inform policy formulation, R&D and education programs.

DFA visualizes this philosophy in the form of a pyramid (Figure 1). Thematically, DFA embeds its activities in three spheres, i.e. craftsmanship, management, and entrepreneurship, with an emphasis on the latter. Entrepreneurship in DFA's definition includes strategic planning, conceptual thinking, development and maintenance of external relationships, spotting market opportunities, and marketing.

Activities organized by the DFA staff are as shown in the rectangles to the right of the DFA pyramid. Specific DFA activities are for example:

**Dairy-café**s, the meeting places for farmers. Here, members can discuss and learn from each other, often while sitting together around a bar full with glasses of milk.

**Workshops**, meetings where participants can deepen knowledge on specific themes, together with people from other organizations. These workshops are often organized by (or in co-operation with) advisory organizations, banks, etc.

**Online forum and databank** allow participants to discuss and exchange knowledge on a national scale.

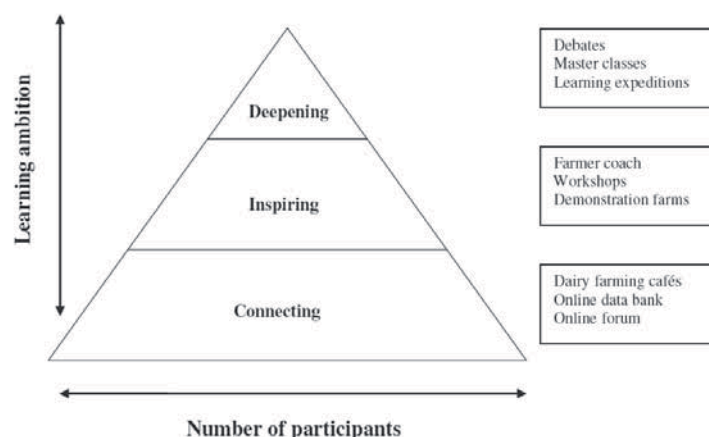


Figure 1. The DFA pyramid, strategy in 2005 (DFA, 2005)

A **farmer coach** is a trained farmer who coaches his colleagues in entrepreneurship skills, for instance to develop a new perspective on aspects of the outer world.

**Initiating new networks.** Several DFA products result from networking activities. Initiating new networks is also an activity of the DFA, usually by hiring network facilitators to help setup new networks. After a few meetings of a new network it is supposed to be able to continue without external support.

Early 2008, the DFA had about 1,000 contributing dairy farmer members (out of a total of 21,000 Dutch dairy farmers).

By words of its own 2008 strategy the DFA is working on new ways of entrepreneurship by working on new ways of learning, on new knowledge infrastructure and on a new future for dairy farming. Compared to the initial strategy there has been a major shift towards a broader learning environment, in which private and public knowledge participants are also involved. DFA not only focuses on the micro-level (on the empowerment of farmers in doing their own business), but now also aims to relate to the macro level. DFA has the ambition to act as change agent in the renewing knowledge system. To realise its objectives, DFA has developed a strategy characterised by the keywords (1) connecting, (2) accessibility of knowledge and (3) stimulation of entrepreneurship and innovation. Key phrases in the approach are working on knowledge, through knowledge networks, knowledge base on the internet and knowledge in practice.

On the basis of the above, DFA can be considered as a network broker that aims to facilitate not only the “farmers learn from farmers” principle, but whose activities are also directed towards other actors in the broader system to stimulate innovation.

## Monitoring and evaluation of impact

Above, we discussed the DFA as a network broker. To assess the results of its activities we have used a Monitoring & Evaluation approach (M&E) that distinguishes between output, outcome and impact of a project. These results are loosely defined as followed:

- Output: direct, targeted results of the DFA activities, direct effects on members;
- Outcome: changes in thinking of the members as a result of the output;
- Impact: changes in the wider system.

These three ‘levels’ of effects are illustrated in figure 2. The output concerns the results targeted directly (i.e. in the objectives) but as a result of this output further changes may occur among the farmers by developing new perceptions (e.g. seeing ‘challenges’ rather than ‘problems’). Such more

'profound' outcomes can subsequently become a starting point for further change that are not directly targeted consequence of DFA activities. Eventually, when various outcomes link up and have a bearing on the wider system this is called impact.

Usually, a project defines its desired output as part of its objectives but the long-term ambition may be much larger as is the case in connection with the DFA (to change the knowledge system at large). A project then develops its strategy to achieve its objectives but usually also has some assumption (in the form of an often implicit theory) on a wider bearing this might have. This combination of the implicit theory and strategy is called the 'intervention logics', i.e. the logics that tells the project leaders why they do what they do.

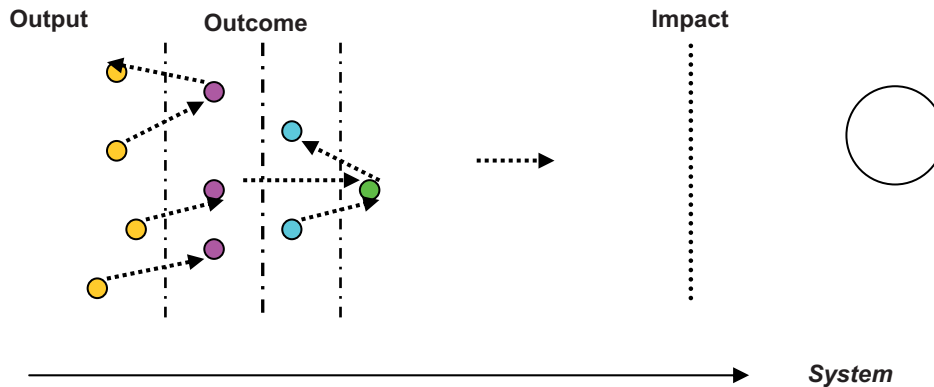


Figure 2. Intervention logics, how output leads to outcome and helps getting impact

To help the project leaders to assess whether they were 'on track' a monitoring and evaluation (M&E) scheme became part of the project in 2007. This started with assessing the outputs (what is being done, direct interventions and their results) and outcomes (changes in thinking, new acting by members and other involved organizations due to the output). The findings of this M&E were partly used to make the strategy and intervention logics of the academy more explicit. This M&E activity was also instrumental for the accountability in the use of public funds.

In setting up an M&E scheme for the DFA, we leaned on expertise from Wals and Lans (Education and Competence Studies, Wageningen UR) who co-operated in this part of the study. In their conceptualisation of the knowledge system or learning environment of the DFA they distinguished between the micro and macro level as shown in figure 3 below.

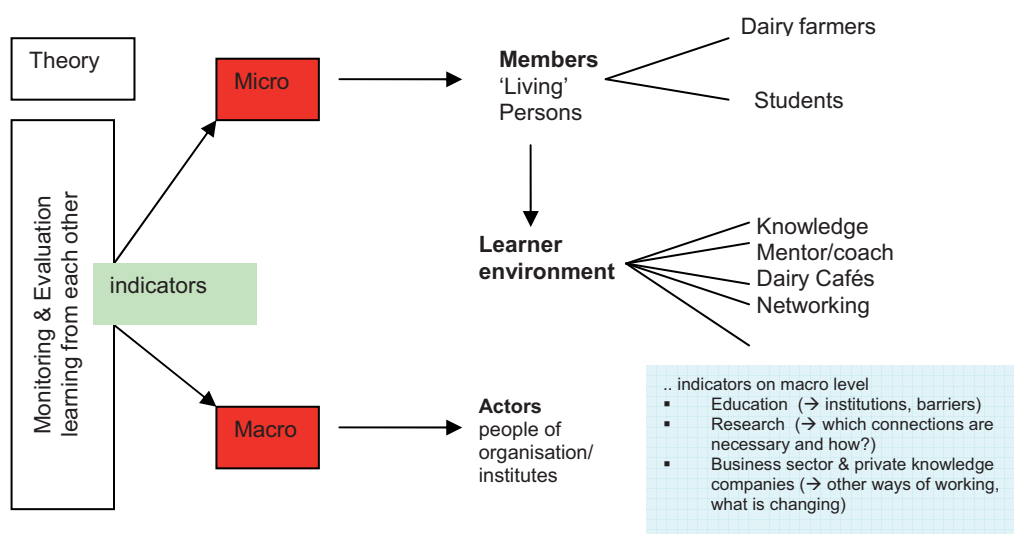


Figure 3. Indicators of studying the impact of the DFA system are distilled from a micro-macro environment

Some of the indicators on the macro level are shown in figure 3. In a workshop about "indicators for the impact DFA" (April 2007, project team) a long table with a variety indicators was developed. It is



beyond the scope of this paper to describe this in detail but some of the indicators will be discussed in part 5 when presenting the major results.

In literature several M&E methods are described. Most of these can be grouped into two major categories on the basis of their primary objective, notably (1) whether they aim at facilitating learning or (2) whether are used to account for the result, e.g. towards financiers (Arkesteijn et al., 2007). Arkesteijn et al. distinguish three groups of M&E methodologies, each of which can consist of various methods as shown in table 2.

Table 2. Methods of M&E

Mainstream method	Working/focus	Methodology
Result oriented M&E	Focus on reaching goals Looking at intervention logics Output – Outcome - Impact	<ul style="list-style-type: none"> <li>▪ Result based M&amp;E</li> <li>▪ Logic charts</li> </ul>
Constructive M&E	By constructing & sharing (perceptions). Focus on learning and understanding process	<ul style="list-style-type: none"> <li>▪ Learning histories (LH)</li> <li>▪ Responsive M&amp;E</li> <li>▪ Most Significant Chance (MSC)</li> </ul>
Reflexive M&E	In complex processes of change, fundamental learning by reflexivity in relation to the learning process	<ul style="list-style-type: none"> <li>▪ Reflexive Process Monitoring (RPM)</li> </ul>

In the initial phase of our M&E project, in which we aimed to analyse the outcome and impact of DFA, it was logical for us to use a result based method. But this was just the first step in a process that will continue in the coming years in which, in 2007, we only studied to what extent DFA was successful in reaching its members. In the years ahead we will also look at (learning) process and for this select a suitable method from the table above. Most likely, given the complex process of a changing environment in which the DFA has to operate, we will select a reflexive approach of M&E.

## Results (impact) of the DFA

As discussed above, in the initial phase of our work we studied the effects of the DFA at the micro level, i.e. on the participating farmers. We carried out a telephone survey among DFA farmer members and enquired about their participation in DFA activities, their satisfaction with this, and their own perception of the effects of the DFA activities. The survey was carried out among 52 out of approximately 1000 DFA members, i.e. a sample of about 5%. In 2005 and 2006 others have also carried out some evaluations of the DFA (Hoekstra 2006; and Oenema, 2006 ) and, where possible, we will relate our results to these earlier findings.

Our exploration was intended to focus on output and outcome but we also asked some questions aimed at obtaining a first indication of wider *impact* (to be deepened in further work). Questions aimed at *output* were, for instance, “how many times did you attend dairy cafés”, or “in how many activities did you participate”. Some of the farmers’ answers already gave us an idea on outcome issues as well, i.e. when they elaborated on their perceptions. The *outcome* findings were gathered systematically following a list of ‘indicators’ (cf. section 4). Examples of outcome related statements were: “the workshops led me to new contacts”, “the DFA stimulated my participation in surprising new meetings”, “the DFA stimulated my entrepreneurship”. The survey further addressed issues like openness, cooperation, new networks, learning environment, learning from each other, bringing in creativity, space for surprising meetings, etc.

Our results here will mainly be quantitative in nature. In our further work, to deepen our understanding of these initial findings, we intend to carry out more qualitative interviews. Below, we will summarise the main findings.

A first interesting finding relates to the characteristics of the DFA community. Earlier surveys indicated that members, non members and others in the knowledge system alike shared the assumption that the DFA is a sort of exclusive community, consisting mainly of young, really big and well educated farmers are members (Oenema, 2006). Our 2007 survey, however, indicated this is a misperception. The DFA farmer seems to be a rather ‘average farmer’. About 75% of the members are aged between 35 and 55 and 68% of them have followed a secondary education, i.e. after primary school but having no academic or masters degree. 48% Have less then 800,000 kg of milking quota where 30% owns

quota of more than 1 million. Because the DFA thus seems to reach a broad variety of farmers and also has a significant membership it seems to be well positioned to achieve its longer term goal of becoming a major change agent in the knowledge system.

To assess the *output* of the DFA we asked our interviewees about their participation in the DFA. Most of the members (87%) participated in one or more of the DFA activities. This implies that some 13% of the members were not active participants of DFA, mostly because of lack of time, a growing problem given that farmers increasingly are expected to become entrepreneurs. Possible reasons like ignorance of DFA activities or lack of activities in their own region were hardly mentioned. In 2006, Oenema also found that lack of time was the main reason of not becoming a member. Our findings indicate that the DFA seems to be well known and appreciated among dairy farmers in The Netherlands.

Asking more concretely about the participation in activities, like attending dairy cafés, workshops, networks and actively using the knowledge base on the internet it appeared that most of the members are quite active. Within a period of one year 68% visited the dairy cafés, 45% even twice or more; 43% visited one or more workshops and 27% joined network(s). Almost no one, however, took part in the full spectrum of activities. When we observe the DFA pyramid, where three different layers of activities target different groups, this comes as no surprise.

To assess the *output* we followed a long list of statements (indicators) to which the interviewees could give four possible answers: "agree", "not agree", "neutral" or "don't know". In connection with the dairy cafés, 84% of the attendees found them very inspiring while 76% agreed that their participation had encouraged them to take a different perspective on their own farm. 56% Indicated that they got out new contacts out of their visit(s).

The workshops were commonly seen (88%) as the place where experience of farmer-colleagues could be related to expertise from specialists. It was also appreciated (71%) as the optimal place to elaborate specific subjects or deepen themes. This suggests that the liaison function that the DFA seeks to fulfil as network broker is acknowledged, at least by its members in connection with the workshop instrument. Networks are not commonly visited but visiting members do see it as the perfect place to get new contacts (91%). Because some of our major indicators in assessing the effects of the DFA relate to topics as getting new contacts, learning from others and learning in an inspiring environment, we can conclude that the DFA has definitely a positive effects on farmer members. But these results do not suffice to conclude whether the DFA plays its aspired role of being a major change agent in the knowledge system.

The use of the internet based knowledge databank provides some further relevant information. Almost half of the members (47%) has used the knowledge base at least once and most of them (89%) have retrieved useful information from it. 33% Have used it to put in some specific questions of their own while a small fraction, about 11%, provided answers to questions posed by others. 28% Were unaware of the existence of the databank which is a positive shift from the situation in November 2005 when the majority of the members (80%; n= 178) did not use this feature (Hoekstra, 2006).

Apart from enabling direct networking, i.e. by people finding each other on the basis of their common interests, the demand-supply databank also allows getting information on the type of knowledge that members seek. In other words, the databank can be used to distil themes for new (networking) activities. This allows the development of a more focussed strategy as of 2008. Although in 2007 only half of the members actively used the databank it is appreciated by members (with a score of 6.9 out of 10) while a large majority of the members (83%) indicated they find it useful to exchange information over the internet. The DFA strategy for 2008 is to follow the member's demand more closely and the 2007 inquiry helps this strategy making operational. This fits the DFA objective to be a demand driven movement. Initially, this was attempted to achieve through the intake scan for new members, in which a profile of information demands and information offering was articulated. But this can now be further refined.

In its strategy, DFA focuses on entrepreneurship rather than craftsmanship. The survey indicates that this is acknowledged by the members. The questions "did you experience a growth as craftsman?", and the same question about entrepreneurship, were answered with yes by 14% and 27% respectively. Thus, about one-quarter indicates that the DFA is on its way towards achieving this role but this raw figure tells us little on what this means and what the DFA has actually achieved. In our later work we intend to explore this in further depth.

Overall, the DFA certainly secured a 'license to exist' from its members. Almost all participants identified themselves with the principle of 'farmers learning from farmers' (98%).

Concerning the wider impact, the DFA also has the objective to influence the knowledge system at large and change it to remedy its shortcomings. It is too soon to assess to what extent this has been achieved but some of the questions posed in our survey do provide provisional answers. Most of the interviewees (57%) agreed that due to the DFA field activities (among farmer members) it feeds (applied) research activities. Thus, most members are convinced DFA influences research. Furthermore, the DFA is widely seen as facilitator of other and better ways of knowledge throughput (77%). The Oenema study of 2006 showed comparable results. Almost two-thirds of the interviewees (64%) agreed that the DFA played a valuable role in the relation between practice and research.

We also enquired about some other possible impacts to the DFA activities on the wider knowledge system. Some 30% of the respondents saw effects, caused by the DFA, on the knowledge exchange with or between education and research. A larger percentage (46%) thought the DFA encourages business partners to use new working forms like the ones used by DFA. Apparently members think the DFA has an impact on the macro level.

Of course, these findings do not prove that the DFA is a generator or initiator of knowledge that affects the entire system. But it does suggest that a definite change is taking place from the old days (the OVO triptych) when the research community decided what would be investigated and developed. Through the DFA, farmers seem to get more grip on the research agenda. As Oenema concluded before it seems that the DFA raises farmers' self-awareness and empowers them to take a more critical stance towards research, knowledge and service providers, and farmers' representatives.

To give further meaning to the findings above, a qualitative deepening research on the effects (outcome and impact) of the DFA is necessary and will be carried out in 2008. The results discussed in this paper do support the conclusion that the activities of the DFA have a noticeable impact on the knowledge system of the dairy farmer but this has to be investigated further. Whether these activities also have an effect on the broader knowledge system is more difficult to assess but we will address this in our further work as well.

## Discussion

As we have shown, the DFA can be considered a network broker that started its task following the "farmers learn from farmers" principle. Gradually, it expanded its activities to link up to the wider knowledge system and uses that as an additional input in the process that basically aimed to enhance farmers' entrepreneurial skills. Hence the subtitle of this paper: *farmers learning from farmers and others*.

Due to the DFA, many dairy farmers in the Netherlands have found a way to empower themselves in a rapidly changing (renewing) knowledge system. Their main means to do so is by teaming up and working together with their farmer-colleagues and jointly develop new avenues towards enhanced entrepreneurship. To what extent they have thus empowered themselves we cannot assess on the basis of the research reported here. One weakness is that our conclusions thus far are based only on members' viewpoints. Furthermore, our findings are mainly quantitative while more qualitative research would be required to draw firm conclusions on the content of the changes. Although our findings do indicate that significant changes are taking place, further research is needed on issues like: If farmers state they have enhanced entrepreneurship, what do they mean? What do they mean by 'surprising meetings' and 'useful new contacts'? Which new strategic choices do they make?

Concerning the knowledge system at large, it is also evident that the DFA has some impact but this should be explored further as well. Certainly, not all changes can be attributed to the DFA since the process of change is occurring on the basis of various other factors at the same time. But in our further work in the coming years we will seek to explore in more detail what the impact of the DFA is in this respect.

## References

- Arkesteijn M, Van Mierlo B, Potter J, 2007, "Methoden voor monitoring en evaluatie van innovatieprojecten" [Methods for Monitoring & Evaluation of innovation projects]
- Bonny S, 1998, "Prospects for Western agriculture during a period of crisis, changing demand, and scientific progress: a case study of France " *Technology in Society* 20 113-130



- DFA, 2004, "DFA business plan, version May 2004".
- DFA, 2005, "DFA progress report", version February 2005,...
- Curran J, Storey D J, 2002, "Small business policy in the United Kingdom: the inheritance of the small business services and implications for its future effectiveness" *Environment and Planning C: Government and Policy* 20 163-177
- De Wilt J G, Diederens P J M, Butter M, Tukker A, 2001, "Innovation challenges for European agriculture" *Foresight* 3 341-352
- Feder G, Willet A, Zijp W, 2001, "Agricultural Extension – Generic Challenges and the Ingredients for Solutions" in *Knowledge Generation and Technical Change. Institutional Innovations in Agriculture* Eds SA Wolf, D Zilberman (Kluwer Academic Publishers, Boston) pp 313-353
- Gielen, P. M., Hoeve, A., & Nieuwenhuis, L. F. M. (2003). Learning Entrepreneurs: learning and innovation in small companies. *European Educational Research Journal*, 2(1), 90-106.
- Guijt I, Proost J, 2002, "Monitoring for social learning. Insights from Brazilian NGOs and Dutch farmer study clubs" in *Wheelbarrows Full of Frogs. Social learning in natural resource management* Eds C Leeuwis, R Pyburn (Koninklijke Van Gorcum, Assen, The Netherlands) pp 215-231
- Hendrikse G, Bijman J, 2002, "On the emergence of new growers' associations: self-selection versus countervailing power" *European Review of Agricultural Economics* 29 225-269
- Hoekstra L, 2006, "Van vraag naar antwoord ?. Eerste ervaringen van ondernemers aangesloten bij de Melkvee Academie". DFA internal report.
- Janssen W, Braunschweig T, 2003, "Trends in the organization and financing of agricultural research in developed countries" in *Research Reports* Ed. ISNAR (ISNAR, The Hague) pp. 1-84 <http://www.isnar.cgiar.org/publications/pdf/RR-22.pdf>
- Klerkx L, 2006, "Percepties van MVA actoren uit het agrarische kennissysteem" [Perceptions of DFA actors from the agricultural knowledge system]. *Communication and Innovation Studies*, Wageningen University, Wageningen..
- Klerkx L, de Grip K, and Leeuwis C, 2006, "Hands off but Strings Attached: The Contradictions of Policy-induced Demand-driven Agricultural Extension", *Agriculture and Human Values*, 23 (2), 189-204.
- Klerkx L, and Leeuwis C, 2007, "Emergence of network brokers for enterprise development in agriculture and their embedding in the broader innovation support system". *Mansholt Graduate School Multidisciplinary Seminar Paper*, Wageningen University, Wageningen
- Klerkx, L., & Leeuwis, C. (2008). Matching demand and supply in the agricultural knowledge infrastructure: Experiences with innovation intermediaries. *Food Policy*, 33 (3), 260-276.
- Kusek J Z, Rist R C, 2004, "Ten steps to a resultbased monitoring & evaluation system", World Bank, Washington
- Knudson W, Wysocki A, Champagne J, Peterson H C, 2005, "Entrepreneurship and Innovation in the Agri-Food System" , *American Journal of Agricultural Economics* 86 1330-1336
- Lans T, Wesselink R, Biemans H J A, Mulder M, 2004, "Work-related lifelong learning for entrepreneurs in the agri-food sector" *International Journal of Training & Development* 8 73-89
- Leeuwis C, 2000, "Learning to be sustainable. Does the Dutch agrarian knowledge market fail?" *Journal of Agricultural Education and Extension* 7, 79-92.
- Leeuwis C, Van den Ban A, 2004 "Communication for rural innovation: rethinking agricultural extension" (Blackwell Science, Oxford)
- LNV, 2005, "Kiezen voor landbouw, een visie op de toekomst van de Nederlandse agrarische sector" [Choosing for agriculture, a vision on the future of the Dutch agricultural sector] Ministry of Agriculture, Nature and Food Quality, The Hague, [www.minlnv.nl](http://www.minlnv.nl)
- LTO, 2006, "Ruimte voor agrarisch ondernemerschap, visie op welvaart en welzijn op het Nederlandse platteland" [Space for agricultural entrepreneurship, a vision on prosperity and wellbeing in the Dutch countryside] Dutch Farmers Organisation, The Hague, [www.ltonoord.nl](http://www.ltonoord.nl)

Nieuwenhuis L F M, 2002, "Innovation and learning in agriculture" *Journal of European Industrial Training* 26 283-291

Oenema A R, 2006, "Yn petear mei./In gesprek met." [Talking with...], DFA internal report.

Phillipson J, Gorton M, Raley M, Moxey A, 2004, "Treating farms as firms? The evolution of farm business support from productionist to entrepreneurial models" *Environment and Planning C: Government and Policy* 22, 31-54

Reardon T, Timmer C P, Barrett C B, Berdegue J, 2003, "The rise of supermarkets in Africa, Asia, and Latin America" *American Journal of Agricultural Economics* 85 1140-1146

Smits R, and Kuhlmann S, 2004, "The rise of systemic instruments in innovation Policy" *International Journal of Foresight and Innovation Policy* 1, 4-30

Wielinga H E, Zaalmink B W, Bergevoet, R H M, Geerling-Eiff F A, Holster H, Hoogerwerf L, Vrolijk M, 2007, "Netwerken met vrije actoren. Stimuleren van duurzame innovaties met Netwerken in de Veehouderij". [Networking with free actors. Stimulating of sustainable innovations with Networks in Animal Husbandry], Wageningen UR

Zilbermann D, Sunding D, Khanna M, 1998, "The changing nature of agricultural markets" in *Privatization of Information and Agricultural Industrialization* Ed. S A Wolf (CRC Press, Boca Raton) pp 257-284