EVALUATION OF A TRAINING PROGRAMME DESIGNED TO IMPROVE THE ENTREPRENEURIAL COMPETENCIES OF DUTCH DAIRY FARMERS.

R.H.M. Bergevoet
LEI (Agricultural Economics Research Institute),
Wageningen University, The Netherlands
Email: Ron.Bergevoet@wur.nl

G.W.J. Giesen and H. W. Saatkamp
Department of Social Sciences, Business Economics Group,
Wageningen University, The Netherlands

C.M.J. van Woerkum
Department of Social Sciences, Communication and Innovation Studies Group,
Wageningen University, The Netherlands

R.B.M. Huirne
LEI (Agricultural Economics Research Institute),
Wageningen University, The Netherlands

Abstract

Due to all kinds of external and internal changes that have taken place on the farm in recent years, entrepreneurial competencies are becoming increasingly important for farmers. Investigating the possibilities for improving these competencies by means of a training programme is therefore an extremely worthwhile exercise. Previous research indicates that the concept of competencies can provide insights into the entrepreneurial behaviour of farmers, and gives a means to evaluate an intervention programme aimed at developing entrepreneurial competencies. This paper describes the evaluation of a training program. The results of the presented study indicate that it is possible to improve entrepreneurial competencies of dairy farmers by means of developing and discussing the farmers' strategic plans in study groups. On average all participants benefited from the program, irrespective of farmer and farm characteristics or the level of competencies at the start of the program.

Keywords: *entrepreneurship, competencies, training program.*

Introduction

Due to all kinds of external and internal changes that have taken place on the farm in recent years, entrepreneurial competencies are becoming increasingly important for farmers. Investigating the possibilities to improve these competencies by means of a training programme is therefore an extremely worthwhile exercise. Previous research indicates that the concept of competencies can provide insights into the entrepreneurial behaviour of farmers, and gives a means to evaluate an intervention programme aimed at developing entrepreneurial competencies (Bergevoet and van Woerkum 2006)

An important task of an entrepreneur is to develop, implement and evaluate a strategic plan for his firm. To do this successfully he/she needs to have a set of entrepreneurial competencies. In the literature, several competency areas related to entrepreneurship are identified (see Man et al., (2002) for an overview). Amongst others, important entrepreneurial competencies are: (1) opportunity competencies which relate to recognizing and developing market opportunities through various means; (2) conceptual competencies which relate to different conceptual abilities that are reflected in the behavior of the entrepreneurs, e.g., decision skills or absorbing and understanding complex information; (3) strategic

competencies which relate to setting, evaluating, and implementing the strategies of the enterprise. They are competencies related to strategic management; (4) organizing competencies which relate to the organization of different internal and external human, physical, financial, and technological resources, including team-building, managing, training, and controlling employees. This group of competencies is closely related to strategic competencies; and (5) relationship or networking competencies which relate to person-to-person-based interactions or individual-to-group-based interactions. These competencies include building a context of co-operation and trust, using contracts and connections, persuasive ability, and communication and interpersonal skills (Man et al., 2002). Networking competencies are also part of these relationship competencies. These can be defined as the ability of an entrepreneur to consult the right members of his network for the right question, at the right moment. Differences in success between entrepreneurs are partly determined by their differences in networking competencies.

To improve entrepreneurial competencies in dairy farmers a 2-year training program was developed. In the training program the participants developed and discussed amongst each other a strategic plan for their own enterprise and by doing so addressed and trained related competencies.

The aim of this research is to evaluate the impact of a training program designed to improve the entrepreneurial competencies of the farmer.

Materials and methods

Fifty farmers actively participated in the training program, the initial project group (P-group) and their progress was tested at the start and end of the program. A comparable group of 114 farmers was selected to participate as a control group (C-group). Members of the P-group participated in the training program meetings which were aiming at improving competencies related to entrepreneurship, whereas the members of the C-group did not. Figure 1 gives the research design.

The impact of the intervention was assessed by means of an identical questionnaire at the start (*t=0*) and end of the study (*t=1*). The questionnaire consisted of two parts. The first part asked for farmer's and farm characteristics and included background demographic information such as the size of the enterprise and the age of the farmer. In the second part questions were asked relating to entrepreneurial competencies and success. This was done in the form of statements that the respondents were asked to assess. Statements were grouped into different clusters. There were statements about (1) the reasons for becoming a farmer, (2) the farmer's general objectives, (3) their desired way of farming, (4) their perception of the environment, and (5) their evaluation of entrepreneurial success. With the exception of the questions for background information, all the statements were closed, Likert-type scaled, statements. Farmers could add comments or other aspects. For a full description of the questionnaire see (Bergevoet *et al.*, 2004).

Figure 1: Research design with project and control group

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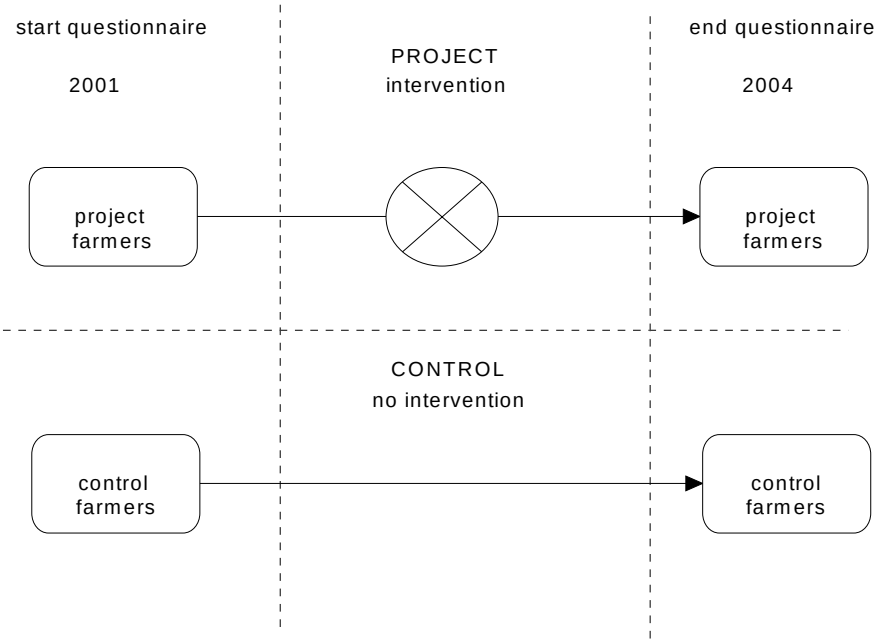

In table 1 conceptually related variables are grouped according to their underlying competencies and combined into summated scales to create new variables. For these variables, the scores on the underlying variables were added up and divided by the number of variables. The new variables were used in the further analysis instead of the original variables.

To determine the impact of the training program while controlling for the value of the indicators at $t=0$, the following model was used (Larsen, 2004):

$$y_{ij} = \beta_0 + \beta_1 x_i + \beta_2 z_j + \beta_3 x_i * z_j + \varepsilon_{ij} \qquad \textbf{(Equation 1)}$$

Where: y_{ij} = indicator value of the farmer i in class j after the training program; x_{ij} = indicator value of the farmer i in class j before the training program; z_j= class ($z_j = 1$ for P-group and $z_j = 0$ for C-group); $x_i * z_j$ = interaction term and ε_{ij}= error term

β_1 gives insight into the relation between the value of the indicator at $t=0$ and value at $t=1$. β_2 indicates a difference in the intercept of the regression lines of the P- and the C-group. The intercept for the C-group is β_0, whereas the intercept for the P-group is $(\beta_0 + \beta_2)$. β_3 indicates a difference in the slope of the regression lines between the P- and C- group. The slope for the C- group is β_1, whereas for the P-group the slope is $\beta_1 + \beta_3$. An intervention effect can represent itself by the fact that β_2 and /or β_3 are significantly different from zero.

Table 1: Entrepreneurial competencies and variables used to create summated scales

Description	Variables from the questionnaire	Indicator
Strategic competencies related to:		
setting a strategy	It is clear to me where my farm has to be within 5 years The targets to go for on my farm are clear to me	STR_SET
to implement a strategy	I have sufficient possibilities to monitor the production-process My objectives are in clear plans that are written on paper	STR_IMP
to evaluate a strategy	Monitoring of my production targets I do by analysis of my farm results The success of my business is the result of a good planning	STR_EVA
Opportunity competencies related to:		
to policy	Policy towards nature Policy towards spatial planning Increasing legislation	OPP_POL
consumers' concern	Consumers concern for the environment Consumer's concern for food safety Consumers concern for animal welfare	OPP_CON
threats of markets	Image of the product Ceasing of internal borders within EU	OPP_MAR
Information seeking competencies	I'm thoroughly informed before I make important decisions I ask for a lot of advice when I need to make important decisions I use the Internet to find information for my farm	STR_INF
Relationship competencies	I invite visitors to my farm because contact to the general public is important to me To met he way my colleague farmers think about my farm is very important I regularly negotiate with suppliers on the conditions we do business	STR_REL
Entrepreneurial success	How much do you like being an entrepreneur? When you look back over the last 5 years, how successful do you consider yourself?	ENT_SUC

Results

The first step to determine the impact of the training program was to compare the indicators for farm and farmers' characteristics and entrepreneurial competencies at *t=0* (before training program) and *t=1*(after training program) of the P- and C- group. The results are presented in tables 2 and 3.

Table 2 Farmer and farmer characteristics of the participating farms: differences between Project and Control group before and after the project

Participants in:		project (n=50)		control (n=114)		
		Mean	SD	Mean	SD	Sign[1]
Age of the farmer	t=0	41.84	9.2	38.82	7.63	**
# FTU[2]	t=0	1.67	0.60	1.71	0.74	
	t=1	1.64	0.54	1.61	0.61	
# cows/farm	t=0	93.40	33.03	76.72	37.08	**
	t=1	101.84	36.95	83.43	37.26	**
Milk/cow/year (l.)	t=0	8441.36	699.68	8426.18	828.68	
	t=1	8510.28	633.26	8477.63	815.63	
Area grass and maize	t=0	58.52	19.51	46.83	20.43	**
	t=1	61.56	21.03	50.39	21.77	**
Milk quota (*10 [3] liters)	t=0	742.69	248.41	621.35	304.91	**
	t=1	833.02	287.27	689.06	329.70	**

*[1] Sign ** P- and C- group are sign different (p<0.05) in independent sample T-test, [2] FTU = fulltime labour units/farm*

As can be seen from table 2, farmers in the P-group were older at the start of the training program and their farms were larger than those in the control group at both the start and at the end of the training program. Both the participants in P- as well as C- group on average increased their farm size during the training program without changing the number of FTU.

As can be seen from table 3, the scores on the indicators for strategic competencies at *t=0* in general are high. For example STR_SET at *t=0* in the training program group had an average score of 4.12 (out of maximum 5.00). These high scores limit the room for improvement and make it more difficult to show an intervention effect. When looking at the opportunity competencies, a difference in perception of the different indicators can be observed. Issues related to policy (OPP_POL) are on average evaluated as a threat (as indicated by negative signs), whereas issues that are related to the consumer (OPP_CON) and market (OPP_ MAR) are on average evaluated as an opportunity (as indicated by positive signs).

Table 3: Indicators of entrepreneurial competencies: differences between the training program (P)- and control(C)- group before and after the project

			Project (n=50)		Control (n=114)		
			Mean	SD	Mean	SD	Sign*
Strategic competencies [a]	STR_SET	t=0	4.12	0.83	3.94	0.77	
		t=1	4.17	0.69	3.92	0.89	*
	STR_IMP	t=0	3.29	0.89	3.04	0.79	*
		t=1	3.44	0.91	3.07	0.89	**
	STR_EVA	t=0	3.70	0.72	3.63	0.74	
		t=1	3.80	0.62	3.70	0.79	
Opportunity competencies [b]	OPP_POL	t=0	-1.18	1.08	-1.56	1.12	**
		t=1	-0.61	1.00	-1.09	1.12	**
	OPP_CON	t=0	1.37	1.02	0.49	1.30	**
		t=1	1.38	1.14	0.54	1.13	**
	OPP_MAR	t=0	0.87	1.23	0.77	1.31	
		t=1	1.48	1.11	1.04	1.15	**
	SRT_INF [a]	t=0	3.82	0.72	3.61	0.67	*
		t=1	3.89	0.60	3.74	0.69	
Relationship competencies [a]	STR_REL	t=0	2.97	0.72	3.15	0.69	
		t=1	2.95	0.73	3.15	0.71	*
Entrepreneurial success [c]	ENT_SUC	t=0	1.90	0.80	1.81	0.85	
		t=1	1.68	0.85	1.77	0.91	

**Sign: P- and C group are significantly (*=p<0.1 and ** = P<0.05) different in independent samples T-test. [a] scales on a 5 point Likert scale (1= not important to 5= very important), [b] scales on a 7-point Likert scale -3= great threat to +3= great opportunity, [c] scales on a 7-point Likert scale -3= very bad to +3=, very good.*

Comparing the results of the P and C-group showed that at *t=0* the values of a few indicators already differed significantly between C-and P-group. At *t=0* higher scores in the P-group were already found for the indicators STR_IMP, OPP_POL, and OPP_CON. STR_INF had higher scores at *t=0*.

Compared to the C-group, at *t=1* a higher score was found in the P- group for the variables STR_IMP, OPP_POL, OPP_CON and OPP_MAR. Also, compared to the C-group, STR_SET scored higher in the P-group. For STR_REL lower scores were found in the P-group. These data suggest an effect of the intervention. To evaluate differences between P and C-group the model as described in equation 1 was tested. Table 4 shows the results.

The perception of success of both members of the P- and C- group did not significantly differ between groups and time.

Table 4 The impact of the training program on the relation between the in value at t=1 and the value at t=0 of the indicators related to farmer's and farm characteristics and entrepreneurial competencies and success.

		Standardised coefficients		
		β 1	**β 2**	**β 3**
Farm characteristics				
# FTU[1]		0.84		
# cows/farm		0.89		1.65
#Milk/cow/year (l)		0.75		
Area grass and maize		0.86		
Milk quota (l)		0.90		
Indicators for entrepreneurial competencies				
STR_SET[1]	Strategic competencies related to setting a strategy	0.51		
STR_IMP	Strategic competencies related to implement a strategy	0.52	0.38 *	
STR_EVA	Strategic competencies related to evaluating a strategy	0.45		
OPP_POL	Opportunity competencies related to policy	0.43		
OPP_CON	Opportunity competencies related consumers' concern	0.29		0.27
OPP_MAR	Opportunity competencies related to threats of markets	0.38	0.18	
SRTINF	Information seeking competencies	0.57		
STR_REL	Relationship competencies	0.78	-0.26 *	
ENT_SUC	Entrepreneurial success	0.66		

β 1= standardised Beta of the indicator, β 2 = standardised Beta of the class (P=1, C=0), β 3 = standardised Beta of the interaction (indicator class). Only significant relations are shown. All shown relations are significant at p< 0.05 except the * marked coefficient, which is p<0.10. [1] For abbreviations see table 1.*

The intervention influenced several farm characteristics. For the P-group on average there is a larger increase in the number of cows in larger farms is than in smaller farms. The slope of the line for the P-group is 2.54 (0.89 +1.65) which larger than 1. The intervention did not result in a significant influence on the other indicators for farmers' and farm characteristics.

Of the indicators of entrepreneurial competencies, several were influenced by the intervention: STR_IMP, OPP_CON, OPP_MAR, and STR_REL.

Compared to the C-group, on average all participants in the P-group had a larger increase of their competencies. For STR_IMP and OPP_MAR the overall level of response was at a higher level in the P-group as shown by a larger intercept in the P-group as shown by a significant β_2. For STR_REL in the P-group the intercept was smaller indicating on average a general lower response level in the P-group.

For the indicator OPP_CON in the P-group participants with high scores on t=0 had a higher score at t=1 compared to the participants of the C-group, whereas the participants with lower scores did not

significantly differ. In the P-group the slope of the relation (β_3) was different: the slope was steeper compared to the C-group.

Discussion

The participants in the training program group showed a significantly higher increase on a number of entrepreneurial competencies. A significant difference was seen in competencies related to implementation of a strategy between the P- and C- group. In the meetings of the training program group particular emphasis was given to improving strategic and opportunity competencies. Participants learned techniques and tools that helped them to translate long-term plans into operational plans and monitor the progress of the implementation of the plan. Also, by making the assignments they were in fact writing their own strategic plan.

New challenges due to the changing market and stricter regulations were the initial motives to start with the intervention plan. Therefore an important part of the program was dedicated to the assessment of the business environment. The participants on average significantly increased their opportunity competencies related to consumer's concern and threats of markets.
The scores on opportunity competencies related to policy increased in both the P- and C- group., however no significant differences in increase could be observed.

Participants with initial low scores showed a higher increase in scores on the indicators of their competencies when compared to participants with initial high scores. It looks like they gained more from the program. A reason for this can be that these initial low scoring respondents have more room for improvement. This can be room for improvement as an actual increase of competencies, but also room for improvement on the used measurement scales.

It has to be stated that high scores on the used scales doesn't necessarily mean that competencies could not be or were not further improved. More differentiated scales at the high end of the indicator value for assessing entrepreneurial competencies could determine a possible increase of these initial high responders.

Conclusions

The results of the presented study indicate that it is possible to improve entrepreneurial competencies of dairy farmers by means of developing and discussing the farmers' strategic plans in study groups.

On average all participants benefited from the program, irrespective of farmer and farm characteristics or the level of competencies at the start of the program.

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References

Bergevoet, R.H.M., C.J.M. Ondersteijn, H.W. Saatkamp, C.M.J. van Woerkum & R.B.M. Huirne, 2004. Entrepreneurial behaviour of Dutch dairy farmers under a milk quota system: goals, objectives and attitudes. *Agricultural Systems 80*: 1-21.

Bergevoet, R. H. M. and C. van Woerkum (2006). "Improving the Entrepreneurial Competencies of Dutch Dairy Farmers through the Use of Study Groups." *The Journal of Agricultural Education and Extension* 12 (Number 1 / March 2006): 25 - 39.

Lans, T., R. Bergevoet, et al. (2005). Identification and measurement of competences of entrepreneurs in agribusiness. *the 8th Ph.D. Conference on Business Economics, Management and Organization Science*, PREBEM/NOBEM, Enschede.

Larsen, P.V., 2004. Module 8: Comparing regression lines, Vol. 2004. statmaster.sdu.dk.

Man, T.W.Y., Lau, T., Chan, K.F.(2002) The competitiveness of small and medium enterprises - A conceptualization with focus on entrepreneurial competencies. *Journal of Business Venturing,* 17(2), 123-142.