SUCCESS FACTORS FOR DAIRY FARMING IN THE NORTH OF ITALY

Francesco Ansaloni

Dept. of Protezione e Valorizzazione Agro-Alimentare "DIPROVAL",
University of Bologna, V.F.lli Rosselli, 107, I - 42100 Reggio Emilia, Italy;
Tel. 039 - 522 - 281 745; Fax 039 - 522 - 294 842.

ABSTRACT/SUMMARY

The study sets out to assess the relation between structural and organizational variables in dairy farms and their capacity for survival. It also highlights a number of factors influencing the success of a dairy farm.
The main results are the identification of links between a number of farm variables and their survival potential. The author also develops a discriminant analysis model to estimate farm survival. Lastly the author illustrates the different types of entrepreneurs active in dairy farming in north Italy.

INTRODUCTION

The application of the "milk quota" system in Europe has, by reducing the number of dairy farms and cows, substantially stabilized the supply side. At medium and long-term, the dairy farm that intends of continue working in the field must possess definite success traits. In this context, the entrepreneurial role would appear crucial.

The definition of success used in this research implies the accomplishment of certain goals that the entrepreneur farmer has set himself or which some other person feels he must achieve [Olsson, 251]. It is felt that the best way to judge whether or not the goals have, in fact, been achieved is to look at the "facts"-ie, the long term survival of the farm. In other words, success means to be able to demonstrate an "ability" to continue in the business by showing valid and considerable prospects for future production.

Success depends both on the availability of resources, in quantity and quality, and on the performance of the entrepreneur farmer. He is the locomotive of the farm's

activity and is the subject of the farm's success so much so that it would be more correct to talk about "a successful farmer" than "a successful farm". To achieve goals where the entrepreneur farmer is not a success actually means achieving nothing.

THE RESEARCH

The research method is based on collecting farm data by interviews. The research was started in 1990 when the policy of "milk quotas" was put into effect in Italy. Farmers were observed from 1990 to 1993 based on continuing or shutting down their animal rearing activity. The dairy farmers subject of this research are members of one of the major milk producing and marketing cooperatives in Italy (Consorzio Emiliano Romagnolo Produttori Latte - CERPL *Granarolo Felsinea*) [Ansaloni 1993]. The sampling covered 889 farms, 40% of the total farmer members (2232). The milk produced is for food use and the animal rearing activity is not exclusive but rather part of a wider farming context. The farms are in the north of Italy, largely in the Po river valley but extending also into Veneto and the Marche. Half of the farms are in the plain, a third in the foothills and the rest in mountain zones.

The dominant type of farm is family run (97%). Other types have paid workers, are cooperatives or some other other form. The most common form of land holding is ownership by the farmer (90%) and the remainder is rented.

Over the period 1990-94, more than 60% of the farms stopped dairy production. Hence, in this study, the farms have been divided into two groups: those that continue in dairy production and those that have ceased (Table 1). The enormous drop out of farms in our sampling confirms a more generalized trend in Italy and in other European Union countries. As regards CERPL, in particular, it should be noted that between 1978 and 1991 the number of farmer members dropped from over 6000 to 1956.

Over the years the ties these farms have had with milk production have been particularly intense. This is due to the personal desire of the farmers to continue this type of work, the peculiar features of the family run farm far more capable of

TABLE 1 - DAIRY FARMS SAMPLED IN THE RESEARCH

GROUPS OF FARMS	N°	% OF TOTAL	MILK PRODUCED PER YEAR IN 1990 (L millions)	% OF TOTAL
ACTIVE IN 1994	335	37.7	29.1	52.5
CLOSED IN 1991-3	554	62.3	26.3	47.5
Closed in 1991	233	26.2	13.0	23.5
Closed in 1992	183	20.6	3.5	6.3
Closed in 1993	138	15.5	9.8	17.7
TOTAL	889	100.0	55.4	100.0

resisting prolonged market crises than other type of farms and the political beliefs that induce the farmers to join cooperatives. Given these circumstances, the decision of numerous farmers to abandon farming must be interpreted as coerced. The specific features of the farmer groups studied, validate the sampling of farms used to assess farm success factors and make the results obtained extremely meaningful.

FARM RESOURCES AND DAIRY FARM SURVIVAL CAPACITY

Statistical analysis was used to see if, because of a given trait, homogeneous populations could be hypothesized for the farms still working and those that ceased production (H_0 = null hypothesis) or whether this can be denied in favour of the opposite hypothesis, that is, that the group of farms still working is significantly different from that of the farms that have abandoned the market (H_1 = alternative hypothesis). Student t tests were used for quantitative variables and chi-square (χ^2) test for quality variables with predictive functions for future farm survival.

The variables where statistical analysis gave positive correlations with farm survival were: total acreage, the number of dairy cows, number of dairy barn workers. Total

annual milk production related to the number of cows and the average yearly production were positively correlated with farm survival. The incidence of the area devoted to fodder cropping over the total acreage was also positive. Correlation between the size of the farm and the number of animals with farm survival is justified also by the fact that the larger size reflects in some way the farmer's desire and determination to continue in his farming work.

Around 40% of the farms has a single worker in the barn while the highest number is three. As the number of workers and the number of animals per worker increase, the farm's survival capacity increases. Only about 30% of farms with a single worker continues in activity while those with 2 or more workers reach a 40-50% survival rate.

Around half the farms are in the plains, 35% in the foothills and 10% are in mountain zones. However, it is the farms in these two latter categories-ie, in relatively disadvantaged areas, that display the best survival potential. This is a sort of negative selection process that can only be explained by the existence of rigid technical and social strictures that reduce production alternatives in these zones.

Average age of the farmers is 54 with 20% under 45 and the rest over 55. Analysis highlighted a statistically significant inverse relation between age and continuation in dairy farming. This would appear reasonable since a fairly long time-frame is an important condition to justify a serious business commitment.

In addition to analysis of the individual farm variables, the data were reorganized to create quality indexes on organization, production specialization level and farm technological level. The index readings, from -1 to +1, are based on the scores assigned to the variables and the weighting given to them based on the relative importance of each variable in the index. The final score is given by adding up all the scores for the variables where the addenda for the sum are the products of the partial scores for the corresponding weightings. The results depend on subjective assessment and should, therefore, be accepted with a degree of caution. Statistical analysis indicated for all the indexes that, on average, the quality of an active farm's resources is higher than that of farms that have ceased production (Table 2). In general terms, the indexes highlight a disillusioning situation for the farms. The average ratings, both for farms still working and those that have shut down, are negative or close to zero.

The variables that do not show any statistically significant link with farm survival

potential-ie, where shut down occurs without reference to type, are: average annual milk production per cow and others relating to animal rearing techniques. Farms with an average annual yield per cow of less than 3000 L and those with average yields that reach and exceed 7000 L closed. The average productivity for the entire sample was quite low: around 3900 L. The low efficiency of the farms is highlighted by the average yield per cow in the farms that continue to work-ie, barely 3868 L, below the overall average (3906) and that of the farms that abandoned production (3905).

Statistically non-significant farm survival variables were: the number of dairy cows per unit of land, dairy cow breed homogeneity level, type of housing and type of milking. The majority of the farms is technically backward. Housing with the cows permanently restrained, justified by small herd size and the fodder production methods used, is adopted in over 90% of the farms. The type of housing influences the milking method used which in 90% of the farms is mechanical without automatic transportation to the chiller. A milking room is used in only 7% of the farms which also use "open housing".

As regards production goals, when the interviews were made, around 95% of the farmers said they planned to keep their milk production at its current level or increase it. Yet, over the following three years, 40% of them abandoned farming. Furthermore, about 20% of the farmers who had said they planned to abandon farming, are still active. A fairly large segment of farmers, therefore, expressed incorrect expectations on market evolution and developments in agricultural policy. Perhaps this is due to lacuna in information or perhaps clear information was not available.

TABLE 2 - VARIABLES CORRELATED WITH FARM SURVIVAL CAPACITY

		AVERAGES	
		ACTIVE FARMS	CLOSED FARMS
Total acreage (ha)		27.3	19.2
Fodder acreage/Total acreage (%)		56	45
Cows (n.)		22.2	14.1
Total annual milk production (000 L)		85.7	59.8
Barn workers (n.)		1.9	1.7
Animal head per worker (n.)		6.7	4.3
Farmer age (years)		53	56
Organization: - personal production goals; - professional level (productive and technical results, annual milk yield per cow); - age.		-0.09	-0.18
Production specialization: - fodder acreage/totale acreage; - dairy cow race homogeneity; - type of insemination; - milk refrigeration.		0.11	0.003
Technical progress: - type of housing; - type of milking.		-0.47	-0.58
		% IN CATEGORY	
Category in farming zone (asl)	-| 300	30	
	300 |- 600	46	
	600 |-	55	
Farmer age category (years)	-| 45	44	
	45 |- 55	41	
	55 |-	32	

DISCRIMINANT ANALYSIS MODEL

A discriminant analysis model was used to determine the probability of continuing dairy farm operation. In other words, the problem is to create a survival index to define to what degree a farm may be assigned to the survival or non-survival group. The analysis was done by calculating a dairy farming survival index for each farm based on the quantity and quality of resources and assigning each a probability level for success (continuation) or failure (cessation of activity). To this end, a linear discriminant equation was made for the individual variables and, based on this, the farms were assigned to one of the two groups.

The dependent variables for the model were the two business decisions expressed by the farmers in the period 1990-3: continue farming or close down the farming operation. This is a dummy variable and, since two groups of farms are taken into account, it can only have two values: 1 (one) farms that continue in their activity and 0 (zero) those that stopped. Independent variables are predictive and their linear function is calculated to forecast the dependent variable more clearly.

The variables selected were those that had passed the statistical tests as correlated with farm survival capacity. These variables are: farm acreage, number of cows, number of barn workers, organizational quality indexes, production specialization level, technical progress level and farm location (plains, foothill, mountain).

The model is based on an initial sampling of 861 dairy farms analyzed. Subsequently, if even a single independent variable was missing the farm was eliminated and so the farms dropped to 527. Of these, 211 continued while 316 abandoned farming.

The results of the analysis show that the model was able, in slightly less than two thirds of the cases, to assign a farm correctly to the group of those that will drop out of farming or to the group that will continue. (Table 3)

The model, by minimizing the risk of incorrect assignation, can determine the probability of success (continuation in farming) or failure (closing) for any farm whose independent variables are known. This latter evaluation is done by

TABLE 3 - DISCRIMINANT ANALYSIS CLASSIFICATION RESULTS

FARM CLASSES		ACTUAL CASES	ATTRIBUTION FORECAST (farms correctly classified)	
			ACTIVE FARMS 1	INACTIVE FARMS 0
Continue farming	1	211	124 *58.8%*	
Stop farming	0	316		204 *64.6%*

Percentage of correctly classified farms: 62.24%.

calculating the model's equation using Fisher's linear discriminant function coefficients. If we have two groups, as in our case, two linear combinations must be calculated. The information given by the multiple independent variables is summarized in a single index. In other words, we can calculate a score for each farm based on the independent variables and based on this score, decide which group to assign it to. A farm is classified in the group that has the highest classification score (SPSS-X 1988, 474).

MOST COMMON TYPES OF DAIRY ENTREPRENEUR FARMER

The entrepreneur farmer can be classified, based on his operating profile, as a conservative, innovator or organizer [Evans 1949, quoted by Karayannis 1990, 257]. In the economic and agricultural field, the classification will be in terms of farm system, family system or hybrid [Russano & Shaudys quoted by Pennacchi 1993, 14]. Remborg & Fock distinguish between "ordinary" and "entrepreneurial" farming activity [Remborg & Fock 1977, quoted by Olsson 1988, 246]. Olsson, based on the risks undertaken and the economic success achieved, distinguishes between the "entrepreneur properly so called" and the "gambler", the "prudent strategist" and the "defensive strategist" [Olsson 1988, 254]. The types of dairy farmer most common in

the north of Italy are: ① non-professional with a very small farm; ② professional running a medium sized farm with an eye to growth; ③ professional running a large farm.

The non-professional entrepreneur farmer with a very small farm rarely has more than 30 cows, often the farm is a part-time activity, the capital is well amortized and farming methods are traditional. This is a businessman who spends little or nothing to purchase technical equipment. Fodder is produced on the farm and the only material purchased is possibly a feed supplement. His goal is to use the production factors he has to hand and, since the family farm is the most common configuration here, he will use the family's labour resources. If even one family member is available to work, the continuation of the dairy barn within the farm context is justified. This entrepreneur farmer does not consider his fixed costs as part of his production costs. He therefore stays in the field for a much longer time than the entrepreneur farmer who makes his decision on the basis of a profit and loss statement. The labour costs are estimated within the family unit as an internal cost [De Benedictis & Cosentino 1979, 291]. Because of the factors this entrepreneur farmer assigns to production, no current rate salary or wages are applied but rather the farmer himself sets a minimum compensation level below which his work is no longer viable [Di Cocco 1979, 79-80]. This businessman's decisional criteria are often only the product of past experience. They are not based on analyzing a profit and loss statement and there is no separation between farm and family expenses. Normally, all farm revenue is taken as "earnings". This type of farmer always regards the price received for his milk, however low, as advantageous. Even if the herd is small, this does not mean that the farm has modest revenues. In farms, often the major money making crops are orchards producing pears, peaches, etc. Furthermore, the family income is often supplemented by non-farming income (part-time work, pensions, etc.). In these situations, farming is substantially "until depletion"-ie, it will continue as long a member of the family can handle the work in the barn. Once this availability ceases due to illness or old age, the farm closes.

The professional farmer operates a family farm, is aged between 45 and 55, usually has a son working with him who will eventually succeed him. The typical

herd is 30-50 cows and the production strategy aims at increasing the size of the farm, improving the technological level of its plant and equipment, genetic improvement of the herd and investment is higher than average [Ansaloni 1988, 141]. Here too, family work is not considered as a production cost. Despite this latter aspect, its survival potential is slight. Often production costs are only slightly below market prices and the entrepreneur farmer tends to overestimate his technical and commercial preparedness.

The professional farmer who runs a large farm is characterized by full-time commitment, investment in proportion to productive needs, modern plant and equipment, use of outside labour resources and high professional qualification. This entrepreneur farmer is also assisted by a successor, usually a son. His production strategy is market and product quality research oriented.

The decisional criteria adopted by this type of farmer are based on analyzing his profit and loss statement. If he makes a profit this justifies his continuation in farming. The survival potential of the farm run by this type of farmer is high. Under these kinds of conditions, production is possible at costs lower than the selling prices. Long term, this type of farmer could belong to the nucleus of Italian dairy farmers that will show the most growth.

REFERENCES

ANSALONI, F. (1988) «Grado di penetrazione della tecnologia nella struttura aziendale ed effetti sulla produttività: livelli di produttività e tecnologia negli allevamenti bovini da latte» in *Meccanismi di trasferimento ed effetti dell'innovazione in agricoltura,* CNR PF-Ipra, Monografia n.25, Bologna;
(1993) «Producers and the Fresh Milk Market in Italy: Results of a Research Project on the Business Decisions of the Dairy Farmers Belonging to Cooperative "Granarolo-Felsinea" (CERPL)» *VII EAAE Congress*, Stresa Italy, *Contributed Papers*, Volume A, Farm Production and Management.

DE BENEDICTIS, M. - COSENTINO, V. (1979) *Economia dell'azienda agraria*, Il Mulino, Bologna.

DI COCCO, E. (1970) *Economia dell'azienda agraria*, ed.riv., Lib.Ed. Nautilus, Bologna.

KARAYIANNIS, A.D. (1990) «The Entrepreneurial Function in Economic Literature: A Synoptic Review», *Rivista Internazionale di Scienze Economiche e Commerciali*, vol.37, pp.245-268.

OLSSON, R. (1988) «Management for success in modern agriculture», *Euro.R.Agr.Eco.*, n.15, pp.239-259.

PENNACCHI, F. (1993) "Unità di produzione agricola di successo", *Intervento al Seminario interno del 31.5.93*, Documento di lavoro, Progetto Finalizzato C.N.R. - R.A.I.S.A. 1.4.

SPSS (1988) *User's Guide*, 3rd ed., SPSS Inc., Chicago, U.S.A.

The author is grateful to Dr Alessandro Duca, Manager Zootechnics Section, "Granarolo-Felsinea" (CERPL), Italy, for data collection and the research facilities made available.

Research supported by a 60% grant (1993) from Ministero per l'Università e la ricerca scientifica e tecnologica (Murst) with title "Mutamenti strutturali ed organizzativi nella filiera lattiero-casearia".