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**End of Project Report - Project 4247**

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# **Winter Housing and Feeding System for Small to Medium Sized Dairy Farms**

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**Authors**

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***S.Crosse<sup>1</sup>, S. Kearney<sup>1,2</sup>, A. Markey<sup>2</sup> and J. Phelan<sup>2</sup>***

<sup>1</sup>Teagasc, Dairy Production Research Centre, Moorepark , Fermoy, Co.Cork

<sup>2</sup>Faculty of Agriculture, University College Dublin, Dublin 4.

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Teagasc,  
Dairy Production  
Research Centre,  
Fermoy,  
Co. Cork  
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## 1. Summary

**A survey of 190 dairy farms** in a co-operative area in the south of Ireland served as the main source of data in the present study. Eight farms representative of the different types of dairy farms were chosen and their data were analysed using the Finpack financial analysis program. These eight case studies were analysed using alternative funding strategies to determine the effect of alternative funding strategies for farm buildings on net farm income.

The data obtained were extrapolated to the national dairy herd. There are some 14,050 dairy farms with quotas of less than 15,000 gallons and 40% of these were classified as non viable. The corresponding figures for other quota categories are as follows: 8,150 farms with quotas of 15,000-25,000 gallons with 40% non-viable; 7780 farms with quotas of 25,000-40,000 gallons with 20% non-viable; and 8,535 farms with quotas >40,000 gallons with 10% non-viable. Non-viable dairy farms were those with low income, low contact with advisory services, low household dependence on farm income, a poor attitude to development and expansion and generally inadequate farm facilities. Non-viable dairy farms should consider changing from dairying into a suckler and/or beef enterprise and should be assisted to do so by the advisory service. They should be considered for a suckler quota unit for each 987 gallons of milk they had been producing. They should consider using income assistants, e.g., REPS, Early Retirement Scheme and/or unemployment benefits as relevant. Training schemes should be targeted at young farmers and their spouses who are not working so that they have a better chance of off-farm employment, when relevant.

Potentially viable and viable dairy farms should be assisted on a sliding scale depending on their quota size, as follows: Grant aid for upgrading milking facilities, grant aid for milking and milk cooling equipment, interest subsidies on interest payment on money borrowed for agricultural development, the smallest milk quota farms should be considered the priority for milk quota reallocation, quota purchase should be subsidised if possible, quota leasing should be subsidised for the smallest quota category (<15,000 gallons), installation Aid should be introduced for all viable and potentially viable dairy farms.

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## 2. Introduction

### 2.1 Study Objective

**The purpose of the study** was to examine the type and quality of farm buildings and feeding systems on dairy farms and to see if the future 'potentially viable' or 'viable' dairy farms could be helped to invest in farm buildings (where investment was needed). With many small to medium sized dairy farmers leaving milk production on an annual basis, many because of the need of substantial investment in farm facilities, it is important for rural areas to retain as many of these farm families as possible.

The objectives of the present study were to establish the following:

- (i) *the quality of dairy farm facilities;*
- (ii) *the overall level of viability of dairy farms; and*
- (iii) *the potential of dairy farms to invest in farm facilities with different ways of financing such investment.*

### 2.2 Methodology

The traditional farm incomes analysis focuses on the farm unit. Now, with rural development an EU priority, criteria other than farm incomes are examined to assess viability. The following criteria are considered; (i) economic/income factors, (ii) demographic factors and (iii) off-farm income.

Four viability classes of Irish farms have been identified. These include:

1. *35,000 viable farms where there is sufficient income to pay family labour and provide a return on investment;*
2. *35,000 non-viable part-time farms which do not generate sufficient income from the farm but have an off-farm income;*
3. *58,300 non-viable farms with a good household structure which have the potential for viable farming; and*
4. *36,700 non-viable farms with no off-farm income and a poor household structure.*

Most dairy farms in the present study fall into Categories 1 and 3. However, on dairy farms an additional criterion should be examined when assessing viability; namely, the adequacy of existing farm facilities to allow the production of milk at the desired EU quality levels. At present many dairy farmers are ceasing milk production because of poor farm facilities.

The study used four sources of information as follows:

- Survey data from 190 dairy farms in a co-operative area in the south of Ireland.
- The yearly Teagasc National Farm Survey.
- Eight case studies which were carried out on farms from within the survey (190 dairy farms) that met the criteria of having 'viable' or 'potentially viable' dairy enterprises; and
- Secondary data including government statistics as well as studies carried out in the area of farm buildings, farm incomes and related topics.

### 3. Results

A summary of the main findings from the survey is provided in Tables 1 to 5; this shows the main differences which emerged between the different dairy farms of different quota sizes.

**Table 1. Summary of household characteristics of dairy farms.**

Characteristics	Quota category (gallons)			
	<15,000	15,000-25,000	25,000-40,000	>40,000
Male farmers (%)	84	93	95	98
Married farmers (%)	66	58	76	79
Farmers over 50 years of age (%)	50	31	29	36
Farmers with Intermediate Certificate or less (%)	89	80	71	43
Farmers with no agricultural education (%)	77	49	66	60
Farmers attitudes to education/training needs	Not Positive	Average	Very Positive	Average
Farmers spouses with Intermediate Certificate or less (%)	65	61	74	70
Spouses attitudes to future education and training needs	Average	Average	Very Positive	Average
Households with 5 or more persons (%)	38	46	44	62
Households with no children present (%)	43	44	39	24
Farmers over 40 years with successor identified (%)	31	21	25	50
Farmers intending to avail of Farm Retirement Scheme (%)	20	44	46	33
Farmers with off-farm employment (%)	21	9	12	2
Spouses with off-farm employment (%)	14	15	35	24
Households receiving state welfare (%)	32	33	24	19

**Table 2. Summary of farm characteristics and farm management practices on dairy farms.**

Characteristics/practices	Quota category (gallons)			
	<15,000	15,000 to 25,000	25,000 to 40,000	>40,000
Average herd size (dairy cows)	15	26	41	68
Farmers with milk quotas of <800 gallons/cow (%)	77	65	40	17
Farmers supplying <800 gallons/cow (%)	73	71	47	23
Dairy cow replacement rate	Poor	Poor	Good	Very good
Average land owned (acres)	62	76	92	130
Average land farmed (acres)	67	84	118	157
Average land rented by acres	5	10	17	24
Farmers conserving hay (%)	70	80	46	57
Level of farmers conserving silage (%)	73	91	100	100
Future plans for dairy herd	Average	Average	Average	Average
Sires used on majority of dairy cows	Beef	Dairy	Dairy	Dairy
Farmers keeping farm accounts	70	91	100	98
Farmers with advisory contacts	34	42	56	76
Production intensity level	Very low	Very low	Moderate	High
Farms with alternative enterprises (%)	13.6	6.7	7.3	4.8
Farms interested in establishing alternative enterprise (%)	20.3	20.0	26.8	21.4

**Table 3. Summary of income levels and cost structures on dairy farms. (NFS)**

Characteristics	Quota Category (gallons)							
	<15,000		15,000 to 40,000		25,000 to 40,000		>40,000	
	/Cow	/Farm	/Cow	/Farm	/Cow	/Farm	/Cow	/Farm
Output value (£)	820	20,450	960	39,150	1,050	56,400	1,075	141,800
Feed costs (£)	180	-	200	-	230	-	260	-
Direct costs (£)	250	7,000	290	14,000	340	20,300	373	53,400
Overhead costs (£)	180	5,700	225	11,300	215	15,200	290	43,800
Total costs (£)	455	12,500	530	25,300	575	35,500	700	98,200
Gross profit (£)	550	13,400	670	25,100	700	36,100	790	88,400
Net profit (£)	370	7,900	446	13,700	485	20,800	500	44,500
Investment in machinery (£)	195	6,300	225	12,600	200	16,500	236	40,000
Investment in buildings (£)	210	6,500	270	14,500	290	21,000	360	55,000
Farm debt (£)	140	4,200	235	11,500	230	16,000	350	55,000
Intensity	Low	Low	Low	Low	Med	Med	High	High
Investment in machinery & buildings	Low	-	Low	-	Med	-	High	-

**Table 4 : Summary of buildings on farms.**

Facilities	Quota Category (gallons)			
	<15,000	15,000 to 25,000	25,000 to 40,000	>40,000
<b>Dairy Cows Accommodation</b>				
Farms with cubicle housing (%)	50	69	85	93
Farms with tie up byres (%)	41	20	2	5
Farms with loose housing (%)	-	20	7	-
Cow accommodation capacity (%)	140	120	118	112
Housing capacity (No. of cows)	20	30	40 to 45	60 to 70
Quality of dairy cow accommodation	Fair	Fair	Fair	Good
<b>Milking Facilities</b>				
Farms using bucket plant (%)	35	2	0	0
Farms using pipelines in byres (%)	33	22	5	0
Farms with milking parlours (%)	33	73	93	98
Quality of milking facilities	Fair	Fair	Good	Good
<b>Milk Storage Facilities</b>				
Farms with mobile tanks (%)	35	2	0	0
Farms with fixed direct expansion milk tanks (%)	34	71	52	82
Farms with ice bank milk tanks (%)	24	27	47	18
<b>Fodder Storage Facilities</b>				
Farms with hay barns (%)	95	87	78	76
Farms with silage slabs (%)	36	42	59	50
Farms with silage pits (%)	20	38	56	69
Farms making big bale silage (%)	45	42	49	33
Farms storing bulk feeds (%)	18	38	90	97
Quality of fodder storage facilities	Fair	Good	Good	Good
<b>Waste Storage Facilities</b>				
Farms using dungsteeds (%)	39	51	27	26
Farms with open slurry pits (%)	25	33	54	52
Farms with slatted tanks (%)	18	24	49	67
Quality of waste storage facilities	Poor	Fair	Fair	Fair

**Table 5 : Percentages of farms with different items of machinery.**

Machinery type	Quota Category (gallons)			
	<15,000	15,000 to 25,000	25,000 to 40,000	>40,000
<b>Percentages of farms</b>				
<b>Tractors</b>				
Small tractor (<70 hp)	84	71	78	62
Large tractor (>70 hp)	23	53	59	86
<b>General</b>				
Fertiliser spreader	82	93	93	95
Pasture toppers	41	71	83	98
Yard scraper	36	67	90	83
<b>Forage Saving Equipment</b>				
Rotary mower	18	22	24	19
Hay turner	61	64	61	60
Baler	9	16	5	7
<b>Waste Spreading Equipment</b>				
Dung spreader	20	29	27	36
Slurry spreader	18	22	49	71
Slurry agitator	9	16	20	52
<b>Feeding</b>				
Tractor loader	55	73	93	95

- The small quota farms (<15,000 gallons) had the poorest education, marital status; and attitudes towards future training was lowest in this group of farms. These farms also had the highest proportion (20%) of farmers with off-farm incomes and the poorest household structure. These characteristics were better in medium quota farms and best in high quota (>40,000 gallons) farms.
- Farm characteristics followed a similar trend. Small quota farms had the smallest area farmed (owned and leased). They had the poorest management techniques, lowest level of contact with the advisory service and lowest production intensity. All of these characteristics improved with increasing quota size.
- Farm incomes also followed a similar trend. Farm income was lowest on small quota farms (<15,000 gallons). Output per dairy



cow was also lowest, as were feed costs, direct costs and overhead costs. Net profit per dairy cow was also lowest on these farms and these farms also had the lowest level of capital invested in buildings and machinery on a per cow and per farm basis. Overall, these dairy farms operated a low input-low output system. Medium quota farms were operating a medium input and a medium output system. The large quota farms (>40,000 gallons) had the highest net profit, highest output per cow, and the highest feed costs, direct costs and overhead costs. They also achieved the highest net profit per cow.

- The small quota farms (<15,000 gallons) had the poorest facilities on their farms. Over 63% of farms had bucket plants and tie up byre pipelines. Dairy housing was of a reasonable standard only and 35% of farms were using mobile milk tanks. Many farms operated a hay feeding system and only 50% of farms had facilities to handle pit silage. Waste storage facilities were poor. There was minimal machinery on the farms with the main machinery being used for grassland management.
- Dairy farms of between 15,000 and 25,000 gallons had facilities which were somewhat better than the small dairy farms. About 25% used bucket plants or pipelines as milking facilities, and 98% had fixed milk tanks. Dairy housing and waste storage facilities were of a reasonable standard. Over 80% of these farms had facilities to handle pit silage. There was minimal machinery on these farms with the main machinery being used for grassland management.
- Dairy farms of between 25,000 and 40,000 gallons had good milking facilities. Over 93% had milking parlours (abreast and herringbone) and all had fixed milk tanks. Dairy housing was reasonably good and most farms used cubicles. The majority had facilities for handling pit silage while the waste storage facilities were of a reasonable standard. There was a reasonable amount of machinery with most farms having machinery for grassland management. About 50% of these farms also had waste spreading machinery.
- The large quota farms (>40,000 gallons) had good milking facilities and all had milking parlours and fixed milk tanks. The standard of dairy housing was good. The majority had facilities to

handle pit silage while overall waste storage facilities were of a reasonable standard. There was a high amount of machinery on farms; nearly all had machinery for grassland management. About 75% of farms had waste spreading machinery.

From the results of the survey into farm and household characteristics on dairy farms, and the results from the Teagasc National Farm Survey for 1993 and 1994 in relation to farm income, it was possible to quantify numbers of viable, potentially viable and non-viable dairy farms, using a model developed by Kinsella (1995).

<b>GOOD</b>	<p><i>most threatened dairy farms</i></p> <p><b>8,480 Small</b></p> <p><b>Total 8,480</b></p>	<p><i>potentially viable dairy farms</i></p> <p><b>4,890 Medium 1</b> <b>4,670 Medium 2</b> <b>855 Large</b></p> <p><b>Total 10,415</b></p>	<p><i>viable dairy farms</i></p> <p><b>1,555 Medium 2</b> <b>6,825 Large</b></p> <p><b>Total 8,230</b></p>
	<i>Household Structure</i>		
<b>POOR</b>	<p><i>non - viable</i></p> <p><b>5,650 Small</b></p> <p><b>Total 5,650</b></p>	<p><i>unlikely viable</i></p> <p><b>3,260 Medium 1</b> <b>1,555 Medium 2</b></p> <p><b>Total 4,815</b></p>	<p><i>potentially viable</i></p> <p><b>855 Large</b></p> <p><b>Total 855</b></p>
		<b>INADEQUATE</b>	<b>ADEQUATE</b>
	<i>Household Income</i>		

Model developed by Kinsella (1995)

The main factors in the model developed by Kinsella in relation to farm household viability were household structure and household income. From the results shown earlier the small dairy farms (<15,000 gallons) were earning an average household income of around £7,900. In addition to this, 34% of farmers were not married in this category, 43% of households had no children present and over 50% of farms were run by farmers over 50 years of age. This meant that approximately 40% of farm households in this category were not viable. This added to the farm income earned meant that while 60% of these farms (8,480 farms) could be potentially viable with state help, the remaining 40% of farms (5,650 farms) were not going to remain in milk in the long term.

The same criteria was applied to the farms in the other quota size categories. Of the farms with a quota size of between 15,000 and 25,000 gallons, again approximately 40% of these farms had poor household structures. This coupled with the income derived on these farms meant that approximately 40% of these farms (3,260 farms) were unlikely to be viable in the future.

The remaining 60% of farms (4,890 farms) in this category were potentially viable with help from the state. About 20% (1,555 farms) of the next category of dairy farms (25,000 to 40,000 gallons) were unlikely to be viable. More farmers in this quota category were married than the previous two categories (<25,000 gallons), the age structure tended to be slightly younger and more of these households had children present. A further 20% of farms (1,555 farms) in this quota category were potentially viable, while the remaining 60% of farms (4,670 farms) were in no immediate risk of ceasing milk production.

The final category of dairy farms (>40,000 gallons) were either viable or potentially viable. While not all farms had good household structures, the incomes derived on these farms was quite good. About 10% of these farms (855 farms) had poor household structures, but these farms could be kept in milk production through milk quota leasing, share milking or other such alternatives. The remaining 90% (7,680 farms) are either viable or potentially viable dairy farms.

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#### **4. Some recommendations that should be considered for non-viable farms.**

- To target these categories for grants for upgrading farm facilities and acquiring more milk quota is not feasible or practical.
- These farms should consider withdrawing from milk production and enter suckler cow and drystock enterprises. Suckler cow quota from the national reserve should be made available to these dairy farms, on the basis of one suckler cow unit for every 987 gallons of milk that was produced.
- Income assistance such as REPS, Early Retirement Scheme and unemployment benefit should be considered where relevant.
- Advisory services might help these farms to make the necessary adjustment from dairying to suckler cows/drystock and to help these farms qualify for any available income support schemes.
- Farmers should consider selling their milk quota. This milk quota should then be made available to other small quota size dairy farms.
- Training schemes should be targeted at young farmers and their spouses who are not working, so that they will have a better chance of finding off-farm employment (largely inapplicable to large non-viable farms).

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## **5. Schemes/regulations which are likely to be relevant to future farm development for the 'viable' and 'potentially viable' farm households.**

The schemes that are most likely to help farmers stay in milk production and other farmers to change to a drystock/suckler cow enterprise or retirement are;

- (1). *Revamped Dairy Hygiene Scheme.*
- (2). *New scheme for grant aid on Plant and Fittings for Milking Facilities.*
- (3). *Reintroduction of Control of Farmyard or Farm Improvement Programme.*
- (4). *New scheme for reallocation of milk quota and subsidising leasing/purchasing milk quota for small dairy farms.*
- (5). *Rural Environmental Protection Scheme.*
- (6). *Re-introduction of Installation Aid Scheme for Young Farmers.*
- (7). *Scheme for interest subsidy on loans for farm development to a level of 8%.*
- (8). *Early Retirement Scheme to get changeover on farm ownership.*

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## **6. Types of financing that might be required by farmers who require to invest in new and upgraded farm facilities and formulating ways of financing such investment.**

This objective was met through the use of case studies. From the eight case studies of different size quota farms the following conclusions can be drawn.

- (1). *Not all small dairy farms (<15,000 gallons) will be able to continue on in dairying when building costs are taken into account. (some would be better off ceasing milk production).*
- (2). *The small dairy farms that do stay in dairying will need ; (i) grants, (ii) subsidised interest on agricultural loans for development, (iii) priority access to milk quota,*

- (iv) *subsidy on lease/purchase of quota @ 40% and (v) intensive advise.*
- (3). *Not all dairy farms between 15,000 and 25,000 gallons will be able to stay in milk production when building costs are taken into account (some might be better off ceasing milk production).*
- (4). *The medium (15,000 to 25,000 gallons) dairy farms that do stay in dairying will need ; (i) grants, (ii) subsidised interest on agricultural loans for development, (iii) priority access to milk quota, (iv) subsidy on purchase of quota @ 25% and (v) intensive advise.*
- (5). *Most farms between 25,000 and 40,000 gallons should be able to survive in dairying as no other option will give them a better income.*
- (6). *The medium (25,000 to 40,000 gallons) dairy farms that do stay in dairying will need; (i) grants, (ii) subsidised interest on agricultural loans for development to 30,000 gallons,(iii) access to milk quota (iv) subsidy on purchase of quota @ 10% to 30,000 gallons (v) intensive advise.*
- (7). *Most large dairy farms should be able to stay in milk production as no other option will give them the same income.*

Only minor grants would be necessary for this group of dairy farms.

## 7. Discussion

From the analysis throughout this study and the data from the case studies, it is evident that the present number of dairy farms in this country cannot be maintained. Many small dairy farms are not viable in their present state, never mind these farms erecting new/upgraded buildings and repaying for such facilities. While some smaller dairy farmers will have to cease milk production, their milk quota could be used to make other small dairy farms viable. The overall goal of any set of recommendations related to milk production, set in the context of maintaining the maximum number of dairy farms must focus on;

- (1). *What can be realistically done to maintain the maximum number of farms in milk production and*
- (2). *Measures that will insure the milk pool released by small dairy farm getting out of dairying will be redistributed to other small size quota farms.*

It has to be accepted that not all dairy farms can be maintained in milk production, but for many small quota size dairy farms to stay in the business they need two things.

- (a). *Firstly they must upgrade facilities on farms to European Union standards and*
- (b). *They must try to increase farm income, through getting access to extra milk quota.*

So any overall survival package to help dairy farmers will have to include the following;

- (1). *Grant aid to upgrade existing facilities or build new facilities.*
- (2). *Subsidised loans to help repayments on building developments.*
- (3). *Access to extra milk quota for farms with a small quota size.*
- (4). *More advisory contact for smaller dairy farms, so that these farms can increase productivity and increase farm incomes.*

For the non-viable dairy farms that have to cease milk production,

these farms will need income aids such as the Rural Environmental Protection Scheme (REPS) and the Early Retirement Scheme (ERS).

While not all dairy farms that are presently supplying milk are 'viable' or 'potentially viable', the vast majority of milk suppliers in the country could be maintained in rural areas with some help. While some small farms (15,000 gallons) and some medium farms (15,000 - 40,000 gallons) are 'not-viable' over 28,000 of the remaining dairy farms could be maintained in milk production in the long term (5-7 years). While many of the medium sized farms would be earning a good standard of living, some have very poor household characteristics which are threatening household viability (i.e. non-viable).

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## 7. Publications

**Kinsella, J. (1995).** *A Study of Development Information Needs of Viable and Potentially Viable Farm Households in Ireland in the Context of a Changing Policy Environment. Ph.D. Thesis.*