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RESEARCH IN ECONOMICS AND RURAL SOCIOLOGY

North-European dairy farms: divergences of models

It is important to be familiar with the diversity of production models and appreciate their strengths and weaknesses to assess the consequences of modifications to support instruments. This is the aim of this analysis, which focuses on six production basins localised in the North of the European Union and which is based on the one hand on Farm Accountancy Data Network (FADN) data processing and on the other hand on experts and cattle breeders. Having lower work productivity than their Northern competitors, French dairy farms have the advantage of a low purchasing cost of production means (quota and land) and of high-performing feed systems. Although they are penalized at present by high mechanisation expenses and major investments, in the medium term they could become economically better performing thanks to progressive loan repayments and future productivity gains.

Introduction

In each Member State, dairy farms are protected from intra-community competitiveness because milk quotas are set per country. Assuming that milk quotas would be withdrawn in 2015 (sometimes mentioned by the Commissioner for Agriculture), the issue of the relative competitiveness of dairy farms would arise in new terms. In this context, our intention in this paper is to provide some elements of analysis to the following main questions: What are the differentials of labour productivity between dairy farms in the North of the European Union (EU)? What is the milk production cost and at what level are products sold? How are differences in labour productivity translated into its remuneration?¹

Tools and methods

The information presented here comes from FADN processing of individual data. Carried out every year for more than thirty years in all the European Union Member States, this survey gives further details on the structure, the economic results and the financial situation of “professional” farms (in the dairy sector, non-professional units account for less than 1% of overall dairy production). The FADN is a statistical tool designed to be representative of the diversity of farms according to region, production orientation, and size category. Its main advantage is that it refers to variables the definition of which is as far as possible homogenized between member States. Even so, we must note that certain economic (among others the family farm income, before tax) and financial (among others fixed assets) indicators are sometimes not very comparable from one country to another. This is due to the calculation of depreciation system (the

length may sometimes differ for an identical property), to the value-assessment of the elements in the assets (land, quotas, and so on), and even to the investment or financial strategies induced through tax policies proper to each State.

In addition to more complete analyses carried out on the EU scale, we study six countries/basins: West-France (FR-W: Lower Normandy, Brittany, Pays de la Loire); North-France (FR-N: Upper Normandy, Ile-de-France, Nord-Pas-de-Calais, Picardy); West-England (UK-SW); North of Germany (G-N: Lower Saxony, Hamburg, Schleswig-Holstein); the Netherlands (NL); Denmark (DK). These six basins provide 38% of UE-15 dairy production (in volume) and include 27% of dairy farms.

All located in the North EU, most of these exporting basins (except for the United Kingdom) often show similar characteristics (climate, agronomical potentialities, feeding system), chiefly in comparison with South-European basins or mountain areas. The cattle breeders of these basins have a common concern, which is to try to increase labour productivity. However, these basins cover a wide diversity of farms. The agricultural policies implemented differ in particular with regard to quota management.

In this work, farms are considered as “dairy” as soon as there are more than five dairy cows. After extrapolation, the FADN (EU-15) collected a (2003) sample of 15,586 farms of this type, representative of a universe of 463,900 units. Here, the analysis more specifically focuses on the 296,600 so-called “specialised” dairy farms, that is to say those for which the value of milk production represents more than 60% of total farm earnings (excluding animal purchases and direct aid). The diversified units represent a quarter of Community milk production. Not so many in the Netherlands, Denmark, and West-England (less than 20% of the total), they play an important role in the West and

¹ This survey was carried out by the «Institut de l’Elevage» and the INRA SAE2 department in Nantes, with the financial support of the “CNIEL” and “Office de l’Elevage”. Authors would like to thank the European Commission FADN for the authorized access to individual data.

even more so in the North of France (66%). In France, unlike what has been noted in the other basins, diversified farms produce almost as much milk as specialised ones. They represent a high-performing model of economic production as much in productivity as in labour remuneration, especially in the North-France mixed farming areas.

Labour productivity

The labour productivity measurement is considered through four indicators: the annual volume of milk production per agricultural work unit (milk kg per AWU and per year); the annual value of agricultural production (including direct aid but excluding animal purchases) per AWU (in euros); the gross value added per AWU; and the standard gross margin² (SGM) per AWU (in Economic Size Units (ESU)). These indicators are complementary in the sense that the numerator expresses a volume, a value, or a fixed/statistical assessment of value.

Among all the specialised dairy farms in the EU-15, these indicators rise up to 179,500kg of milk per AWU, 81,200 euros of agricultural production (including direct aid), 25,600 euros of gross value added per AWU and 40 ESU of standard gross margin per AWU. Whatever the selected indicator, substantial gaps appear between areas (table 1).

French specialised farms on plains have labour productivity almost two times lower than that of the Danish and Dutch units (including SGM per AWU, the results of which are nearly the same). In relation to (West) English farms, the production of which is nonetheless the highest in Europe per farm, the gap is lower on the productivity indicator in value because of low milk valorisation in this country (see graph 1: milk price = milk produce per t of milk). It is for this same reason that labour productivity in value in North-Germany farms is close to the levels reached in North-France (the gap is 33% in volume and 5% in value). As well as the price of milk (incidentally lower in France than in Denmark and The Netherlands), French farms are advantaged by the importance of co-products associated with milk. Due to calf price and, particularly, to cull cows and also due to lesser milk productivity (more cows with identical milk volume), the beef-meat co-product comes to 64 euros per ton of milk in West-France against 30 euros/t in the Netherlands, Denmark and England. In the same way, the amount of direct aid per ton is higher in France, particularly because of the large place taken by maize silage in the forage systems (graph 1).

The lower productivity level in French farms, including in the large-sized ones, is firstly due to national agricultural policy choices. Indeed, in all departments, because of the administered management of milk quotas, it is more difficult for large units to get additional volumes of milk (as a priority, quota redistribution is in favour of small and medium-sized units). We do not see this situation in countries where quota purchases are free and disconnected from land. Labour productivity gaps are then explained by the interlinked effect of several factors:

- In French units, the workforce is essentially a family one and there is a large proportion of French GAECs (agricultural groupings of farms, with limited responsibility). This organization does not exist in other member States where the share of hired workforce increases with size. The use of hired workers allows farmers to easily adjust the workforce number according to real needs;
- The use of subcontracting seems to be more frequent in the northern competitor countries. It is integrated into many Danish farms' strategy (where certain farms grow very quickly), Dutch ones (with high-skilled milking related tasks), or English ones (where there is a way of postponing investments).

The high labour productivity in Danish and Dutch farms may be explained by a progressive substitution of assets over work (graph 2). On the Community average over the fifteen last years (from 1989 to 2004), both countries' farms have invested more in buildings and milking equipment than the average and more than West-France. Over the five last years (from 1999 to 2004) in most of the basins, the investment per ton of milk (in 2003 constant euros) has speeded up with the exception of West-England where it remains particularly low.

Milk production costs

An assessment of milk production cost has been made by relating overall expenditure to the ton of milk produced (2003 data). On the community average, the expenditure amounts to 333 euros per ton of milk, that is to say a higher amount than the sale value of a ton of milk (315 euros per ton). Even so, this does not mean that farm income is negative since co-products (calves, cull cows and cereals) and direct aid must be added to the "milk" produce (see graph 3).

In West-France, expenditure amounts to 379 euros/ton on average. French farmers benefit from a feed cost (purchases of rough and concentrates for cattle feed) which is among the lowest in Europe because of the extent of available areas and good forage yields. However, they are disadvantaged by the high mechanisation expenditure (work by third parties, maintenance of equipment, fuel, equipment cost) which represents 118 euros/t of milk in the West and 122 euros/t in the north. In both French basins, the investment in equipment (traction, ploughing, harvesting, forage distribution) amounts to 50 euros on annual average over five years (1999 to 2004) against 38 euros/t for the community average. English farms show the lowest milk production cost (265 euros/t). They do not invest much and are led to minimize their expenditure in a context where the milk price is particularly low (in 2003 it was 53 euros per ton lower than that of the two French basins). In Denmark, milk production cost (407 euros/t) may be explained in particular by high financial costs linked to major investments (graph 2). In the Netherlands, production cost is well placed in the community ranking (319 euros/ton), all the more so since it is in a favourable context for prices. In North Germany, production cost (344 euros/t) is also competitive, but with a less advantageous milk price.

² The SGM corresponds to an assessment of the farms' potential added value and is determined by applying coefficients, depending on regions, and physical production units (surface area and livestock). SGM is measured in Economic Size units (ESU) (1 ESU = 1,200 euros).

The link between labour productivity and income

The analysis of the farms' economic situation is made on the basis of a semi-constant FADN sample from 1999-2003, which helps limit the possible economic effects. In parallel with the labour productivity indicator (in volume), three economic indicators were selected (graph 4).

- Family farm income per family AWU. This indicator, often used in France, is sometimes fragile in the comparative analyses between countries (this is notably the case in Denmark). This is for at least three reasons: the repayment period for the same good varies from one country to another; farm financing conditions are not homogenous (interest rates, system of capital repayment, length of loans); and tax policies are not harmonized between Member States.

- Cash flow per family AWU. This indicator is useful when large external financial resources are added to resources coming from productive activity and when investments are not graded according to the present production level but in order to generate much larger volumes of production, later. It results in a complete assessment of the overall mobilizable money resources by taking into account the balance of debt operations and the balance of operations on capital.

- Cash flow (non-deducted land purchases) per family AWU. Here, the land purchase value is added because it corresponds to a patrimonial saving and represents a delayed income, which will be valued at the end of activity when the farm is sold.

Therefore, gaps in productivity between countries are greater than gaps in economic results. In Denmark and because of the dynamics of investments, the family farm income is clearly low, compared to cash flow (non-deducted land purchases). In the United Kingdom, good results are due to the conjunction of high work productivity and limited investments. In France, work remuneration levels are lower but in lesser proportions than for labour productivity.

Strengths and Weaknesses of basins

In France, particularly under the influence of rules linked to milk quotas, the structures and incomes are more homogenous than in the other countries/basins in the survey. This is particularly due to the fact that the farms' growth, in the form of French GAEC (agricultural associations of farms with limited responsibility), leads to labour productivity gains that are lower than elsewhere. In both French basins, the production system is often rich enough in employment and thrifty in variable expenditure. Moreover, the cost of some production factors (land, quotas) is much lower, which tends to limit enlargement costs and fixed assets. Fixed costs are very high, leading to a high level of investment, a trust in future production, through the modernization of buildings/equipments. It also corresponds to an advance in environmental standardization in relation to other basins

(England and Germany). Related to production per litre, mechanization costs are high while per farm they are comparable to those of other basins. In favour of working conditions, this choice weighs on incomes because it has gone further than what limited profits allowed recently. It will probably be a source of adaptation for the future period. The valorisation level of products (milk price, meat co-products...) is also an advantage for French farms. Remuneration is lower there than in the other basins, but this not specific to milk producers. It is also the same for hired workers in industry and services.

In Denmark, as far as production costs are concerned, room for progress seems large. The costly investments recently made in buildings and equipment are for a period of ten to twenty years. When the corresponding loans are repaid, higher production than the current level will be possible with the investments made, which also makes it necessary to keep on restructuring. The investments were planned for higher production than the present volumes. The same goes for financial and repayment schedules. Consequently, projections regularly predict a reduction of the number of dairy farms in this country (from about 5,900 in 2005 down to 3,000 in 2015).

In the Netherlands, the optimisation of production systems (in terms of input consumption, mechanisation, and subcontracting) is already good and on average allows excellent economic effectiveness. Combined with a milk price, which is among the highest in the EU, this leads to good economic profit; this is not unrelated to the high purchase cost of milk quotas (2 euros per kg). In such a context of price and effectiveness, the farms' growth in volume appears to be one of the solutions to improve income per worker in the short term.

As for England and North Germany, they show two common characteristics: a price level per ton of milk, which is much lower than the community average; and an investment level per ton of milk produced which is also far lower (chiefly in buildings-equipment). However, although in England, this situation has led to an underlying decline in milk production, it is not the case in North Germany, where large-scale individual developments in milk production seem to be possible. Not only do the models of production differ between northern European countries/basins, but the paths followed are not the same: the "French model" may be qualified as social and territorial; the "Danish model" systematically favours growth in volume and productivity gains. The "Dutch model" favours economic effectiveness and the development of robust and patrimonial family businesses. The "German model" is shared between the (quite large and competitive) northern units and the (smaller) Bavarian units. As to the "English model" it may be said to be "thrifty" (low production costs) and obsolete (limited equipment, low renewal rate of cattle breeders, moderate investments). This diversity of production models will weigh on the debates, which will be taking place among the community authorities on the appropriateness of withdrawing or keeping the milk quotas system.

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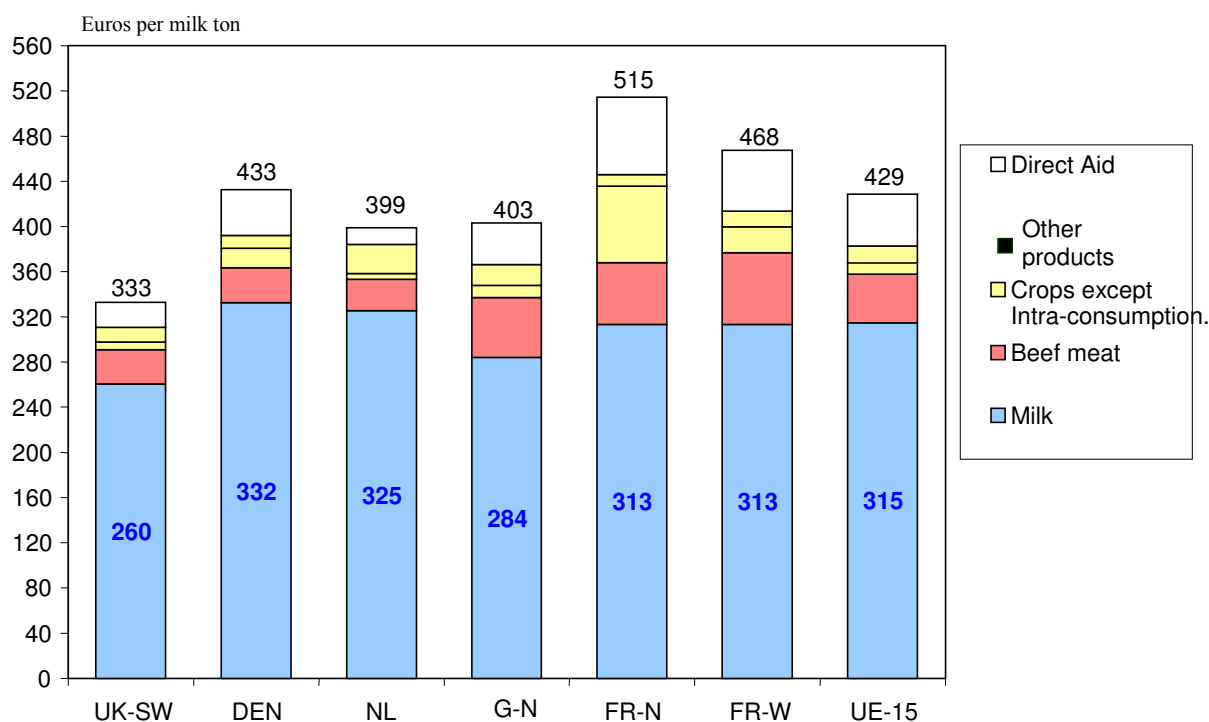
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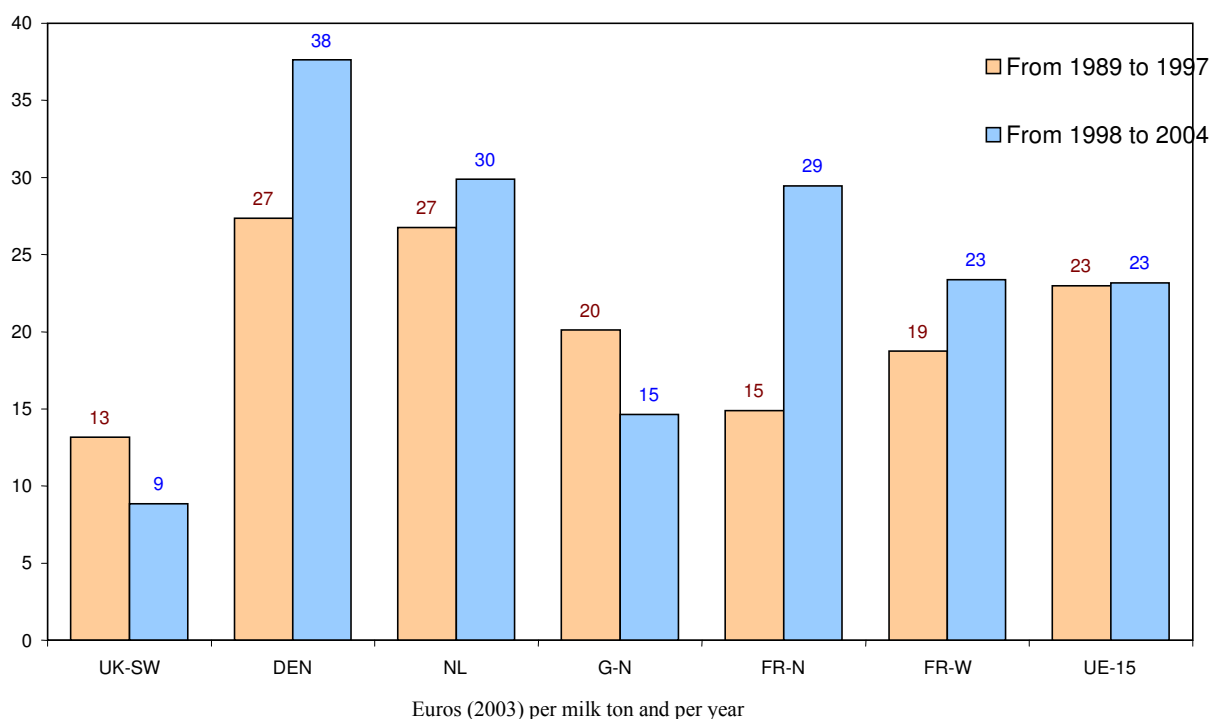
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Graph 1: Products per milk ton in specialized dairy farms (2003, in euros/t)



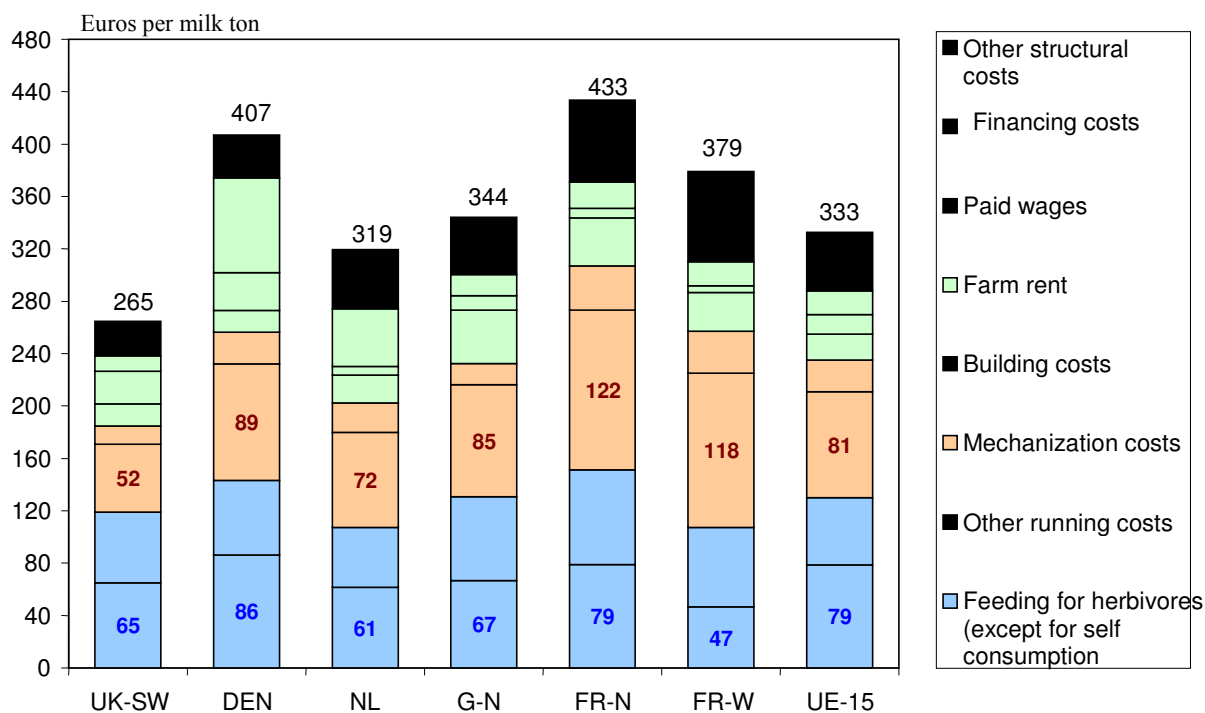
Euros (2003) per milk ton and per year
Source EU FADN 2003, European Commission (DG AGRI-3)

Graph 2 - Investments in buildings (in euros/t of milk) in the specialized dairy farms (from 1989 to 2004)
(Euros per milk ton)



Euros (2003) per milk ton and per year
Source EU FADN 2003, European Commission (DG AGRI-3)

Graph 3: Costs per milk ton in specialized dairy farms in 2003 (euros/ton)



Source EU FADN 2003, European Commission (DG AGRI-3)

Graph 4 Family farm income and Cash Flow per Family AWU in specialized dairy farms (euros, 1999-2003)

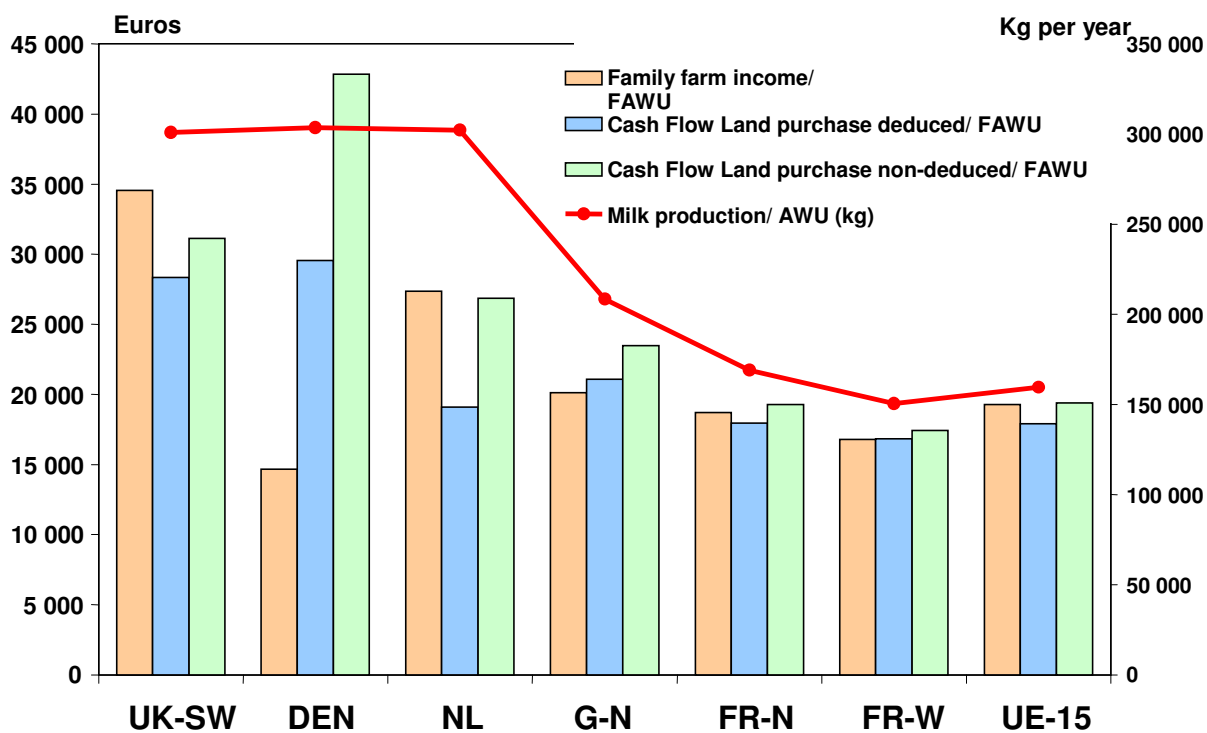


Table 1: Structural characteristics and labour productivity in specialised dairy farms (2003)

	UK-SW	DEN	NL	G-N	FR-N	FR-O	UE-15
Number of farms (extrapolated)	10 300	6 390	20 850	14 640	4 460	30 600	296 620
Annual Work Units (AWU)	2,24	1,86	1,69	1,85	1,73	1,75	1,83
Paid AWU/ total AWU	33%	34%	9%	16%	9%	5%	14%
Utilised Agricultural Area (UAA in ha)	86	90	46	70	72	64	54
Fodder areas / UAA (%)	87%	67%	94%	84%	62%	75%	79%
Maize silage /PFA (%)	7%	25%	17%	23%	34%	30%	15%
Cattle equiv. Unit herbivores	153	135	104	115	88	73	80
Cattle equiv. Unit herbivores / ha of PFA	2,0	2,2	2,4	2,0	2,0	1,5	1,9
Dairy production (kg per year)	729 500	649 200	544 500	428 600	304 700	264 800	328 500
Dairy production per dairy cow (kg)	7 100	7 700	7 400	7 100	6 600	6 400	6 600
Dairy production per ha of UAA (kg)	8 500	7 200	11 800	6 100	4 300	4 200	6 100
Milk produce/farm produce, except direct aids	79%	83%	84%	76%	69%	74%	77%
Dairy production per AWU (kg)	325 600	349 000	322 200	231 700	176 100	151 300	179 500
Production + direct aids / AWU (€)	114 400	154 100	129 100	95 000	91 700	72 600	81 200
Gross added value/ AWU (€)	36 400	49 400	53 600	22 300	22 300	21 000	25 600
Standard gross margin/AWU (ESU)	54	73	77	54	47	37	40

Source : FADN EU 2003, European Commission DG AGRI-A3 / INRA-SAE2 Nantes and Institut de l'Élevage processing