Analysis of international competitiveness of milk production in the framework of the IFCN

Analýza mezinárodní konkurenceschopnosti produkce mléka v rámci IFCN

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Abstract: The International Farm Comparison Network (IFCN) is a world-wide association of agricultural scientists, advisors and farmers. Within this framework, typical farms for the most important production regions are established and their economic situation is analysed. The farms can be projected into the future. Data collection, economic analysis and projections are done with internationally harmonised methods. Among the three IFCN branches (dairy, beef, arable), the dairy branch is most advanced. The members of the dairy consortium meet once a year, and a joint book (Dairy Report) is published annually. The article outlines the organisational concept of the IFCN and presents some selected results from the Dairy Report 2001.

Key words: milk production, international comparison, economic analyses, typical farm

Abstrakt: Mezinárodní síť pro srovnávání zemědělských podniků (IFCN) je mezinárodním sdružením pracovníků výzkumu a poradců v oblasti zemědělství i zemědělců samotných. V rámci této sítě jsou stanoveny typické farmy pro nejdůležitější regiony s danou produkcí a je analyzována jejich ekonomická situace. Jsou vybírány farmy průměrné velikosti i farmy velkovýrobní. S pomocí jednotných postupů a metod může být naplánován budoucí vývoj těchto farem. Sběr dat, ekonomická analýza i projekty jsou prováděny podle mezinárodně zkoordinovaných metod. Článek pojednává o organizačním uspořádání mezinárodní sítě IFCN a popisuje vybrané výsledky ze Zprávy o mlékařících farmách za rok 2001.

Klíčová slova: produkce mléka, mezinárodní srovnání, ekonomická analýza, typická farma

INTRODUCTION

The globalisation of economy and the on-going liberalisation of agricultural trade policy may lead to a considerable re-allocation of agricultural production.

Farmers, agribusiness companies, and agricultural policy makers want to know, which perspectives their 'own' region will have in the future global competition.

Agricultural economists usually try to give answers to such questions by applying international trade models which reflect both supply and demand on agricultural markets in highly aggregated figures. A farm level view is usually not included in such type of analysis.

By establishing the International Farm Comparison Network (IFCN), we try to make farm level information better available for the future-oriented assessment of international competitiveness.

It should be very clear from the beginning that this is not an attempt to replace international market models. The world's agriculture cannot, of course, be reflected through the farm-level analysis of just a few typical farms per country.

On the other hand, highly aggregated models (e.g. world trade models) have their limits, too, because they usually only rely on 'estimation-based' assumptions on the supply-behaviour of agriculture in different countries. As a result, crucial questions like the identification of reasons for differences in production cost or the likely effect of new technologies on the economic situation of farms cannot be answered sufficiently with these kinds of models.

Thus, the question is not whether the concept of IFCN is better than the concept of world trade models, but how both approaches can best complement each other.

THE CONCEPT OF THE IFCN

The International Farm Comparison Network (IFCN) is a world-wide association of agricultural scientists, advisors and farmers.

Within the framework of this co-operation, farms and agricultural production systems are defined that are typical for their region. Their economic situation is analysed, and the farms can be projected into the future.

For the most important agricultural products and production regions in the world IFCN shall provide answers to the following questions:

– How is farming done (farming systems, production technology)?
– What is the level of production cost?
– What are the reasons for advantages and disadvantages in competitiveness?
– What is the future perspective of agricultural production at the locations considered?

For this purpose, models of typical farms are established for each location and analysed using internationally harmonised methods.

Given the availability of accounting data bases in most regions, we are often asked why the IFCN is creating a new data base. Our experience has shown that the existing data sets show significant country to country – differences in methodology. These differences affect for example depreciation methods, the recording and valuation of labour input and the separate recording and valuation of volumes and prices of means of production. Moreover, important data are often missing so that only a partial cost analysis is possible. Ex-post correcting or amending of the data sets is very often impossible or requires a very high input; moreover, it is a potential source for errors. As a consequence, the IFCN-strategy – creating a consistent data set for every typical farm by using the information of existing data sets – is time saving and more appropriate with respect to comparability of results on an international scale.

Selection of typical farms and data collection

In the first step, the regions and locations which are most important for the product considered (e.g. milk, beef, wheat, cane, soybeans) are identified. As a rule, these will be the main areas of production, but in some cases, they may be the regions with a particularly high potential for the expansion of production.

In the second step, experts are contacted with a sound knowledge of the local conditions, with access to regional accounting statistics and with good contacts to practical farming (e.g. technical advisors). With these experts, the main structural characteristics of the typical farms to be established are discussed (e.g. type of farm, size of farm). It is aimed to establish both an average size farm and a large-scale farm for each region.

With the help of the local expert and of farmers managing farms that are similar to the typical farm to be established, the database for the typical farm is compiled. Furthermore, the panel (local expert plus farmers) shall also discuss farm level strategies for the projection of the farms (e.g. introduction of new technologies, adjustment to policy changes).

The concept of panels has proven successful in policy advice since the early 1980s in the USA. There, usually five farmers participate in a panel. In the early phase of IFCN, starting in the mid-90ies, this concept had been taken over exactly in order to use identical methods. In the meantime, experience has shown that depending on the task of the analysis, panels of different sizes are more appropriate. In most cases, a 'pre-panel' is formed in the first step where the national coordinator, the regional expert and one farmer participate. The bases for the typical farm are the single farm data provided by the farmer and the advisor. These data are 'corrected' in order to eliminate particularities of individual years and other single-farm specific issues. The expert knowledge of the participants plays an important role in this procedure. This quick and low-cost approach is appropriate when a speedy collection of internationally harmonised data for many farms in many countries is in the focus of attention. For in-depth analysis of typical farm adjustments to technological and political conditions, a full panel is formed.

The data set for the typical farms comprises accounting data for the whole farm, enterprise budgets for all products (divided into quantity and price components, wherever possible), and additional information. It is based on "hard facts" (e.g. accounting statistics, farm and enterprise comparisons) and on expert knowledge of the panel members.

One considerable advantage of constructing "virtual" farms instead of using unchanged individual farm data is that problems with regard to data confidentiality can be avoided. This increases the flexibility and the speed of the whole system.

As IFCN farms are not representative in a statistical sense, it is important to analyse where each farm is sitting on the distribution curve of all farms in the country. Hence, it is attempted to compare important variables (e.g. farm size, farm profit) of the typical farms with statistical information about all farms in the region or in the country.

Establishment and maintenance of the global network

A world-wide network needs a sound financial basis and a professional organisation. The first idea was to establish a hierarchical structure with world region centres and national centres which cover all major farm types. We had to learn, however, that there were hardly any research institutions in the world who could (or wanted to) make a couple of researchers available for this kind of international co-operation. In the next step, the FAL started a couple of PhD-studies analysing the competitiveness of certain commodities. These studies showed the potential of the approach and yielded some interesting results – but no sustainable infrastructure.

Since 2000, we are proceeding strictly branch-wise. In the first step, we establish a network only in the field of milk production. For this branch, we try to develop and apply organisational and financial arrangements that safeguard a sustainable network development. Those arrangements that prove to be successful in the dairy network, shall step by step be transferred to other agricultural branches. The IFCN beef branch has been launched in 2001, and we intend to develop the IFCN crop branch in the near future.

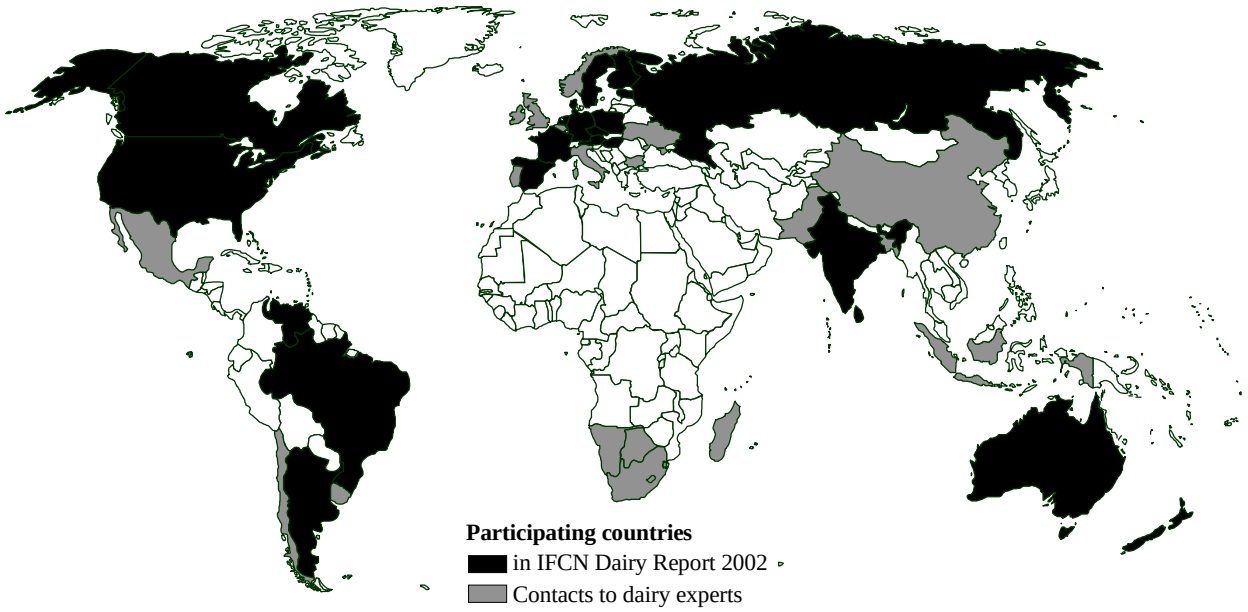

Figure 1. Development of the IFCN dairy network

A branch can only be started successfully, if there is a chair person at the IFCN coordination centre in Braunschweig who gives a long term commitment to this activity. This person is responsible for the establishment and the maintenance of the global network, for the design of the projects and for the economic sustainability. The global network is developed step by step. The participating researchers from all countries become members of a consortium that meets once a year. The overhead costs at the IFCN coordination centre are financed through consortium fees, research projects and sponsoring. The consortium members can use their IFCN member status in their own country for projects, conferences and sponsor contacts as well.

In the IFCN dairy network, researchers from 24 countries take part in the year 2002. The participating countries account for more than 70 percent of world milk production. The map shows the regional distribution and the development. The annual dairy conferences last for half a week. The purpose is to

– discuss the economic status and the developments of the dairy industries
– clarify open questions on the update of the typical farms
– exchange information on a pre-selected special topic
– prepare or discuss projects
– come to agreements on the future development of the network.

Each year, the results of the farm comparisons and the results of special studies are published in the IFCN Dairy Report. The projects are not restricted to the farm level. For example, one project aimed at the analysis of the margins between producer and consumer milk prices in several countries. Both the results of this project and the requests that we get from the industry encourage us to continue this kind of work, too (Figure 1).

RESULTS FROM THE DAIRY REPORT 2001

To illustrate the work of the IFCN, some results from the Dairy Report 2001 shall be presented for dairy farms from six selected production regions (Germany, USA, Poland, Argentina, India, New Zealand).

Table 1 shows some characteristics of the selected farms. It is remarkable that there are tremendous differences between the farms in almost all relevant aspects (farm size, milk yield, fodder base, degree of specialisation). It can be assumed that these differences will also determine different reaction patterns when the farms are faced with new technologies, changing economic conditions, or different agricultural policies.

Figure 2 shows that dairy farms in the different parts of the world are facing quite different returns. It should be noted, that only the returns of the dairy enterprise are presented here, the returns of other farm enterprises have already been excluded. As can be seen, there are not only big differences in milk prices but also in non-milk returns. This can be explained by various reasons, for example by differences in the production system (e.g. different breeds, different culling rates), by differences in policy support (e.g. the EU beef policy, the EU acreage premiums, the US market loss payments), by the participation in certain environmental programmes, or by additional receipts from selling manure for heating (India). Figure 3 analyses the total costs of milk production. As the cost figures shall be directly comparable to the milk price figures, we have here calculated the cost for "milk production only". This is done by deducting the non-milk returns from the total costs of the dairy enterprise. Hence, the graph shows the milk price level which the selected farms needed in order to cover their full economic costs in the year 2000.

Table 1. Characteristics of the selected farms

Country	Region	Cow	Milk yield	Production	Returns from dairy	Land*	Grassland
		no.	t/cow	t/farm	%	ha	%
EU-countries							
Germany	Bayern	35	6 405	224	97	35	66
Germany	Niedersachsen	68	7 730	526	86	90	40
Germany	Sachsen Anhalt	650	7 982	5 188	65	1 700	33
USA							
USA	Wisconsin	70	9 755	683	99	95	0
USA	Wisconsin	600	9 346	5 608	100	405	0
USA	Idaho	2 100	9 747	20 468	100	249	0
Central Europe							
Poland	North West	3	2 951	9	23	10	45
Poland	North West	20	4 482	90	79	41	62
Poland	North West	180	4 820	868	45	1 000	31
South America							
Argentina	Cordoba	150	3 758	564	97	250	92
Argentina	Buenos Aires	600	6 962	4 177	100	650	72
Asia							
India	Haryana	4	2 095	8	36	4	0
India	Haryana	22	5 511	121	78	7	0
Oceania							
New Zealand	North Island	222	3 967	881	100	124	100
New Zealand	South Island	478	4 159	1 988	100	267	78

Source: IFCN Dairy Report 2001

*Land used for the dairy enterprises
Grassland: Land used for grazing, grassilage or hay

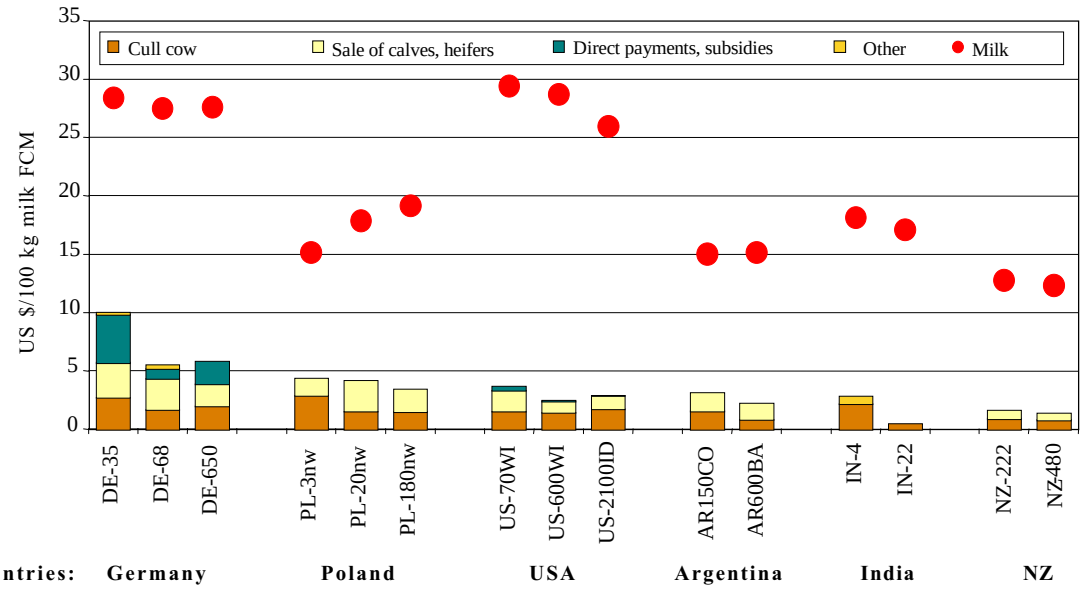

Figure 2. Returns of the dairy enterprise

Source: IFCN Analysis 2001, data refer to the year 2000
Other: Selling manure

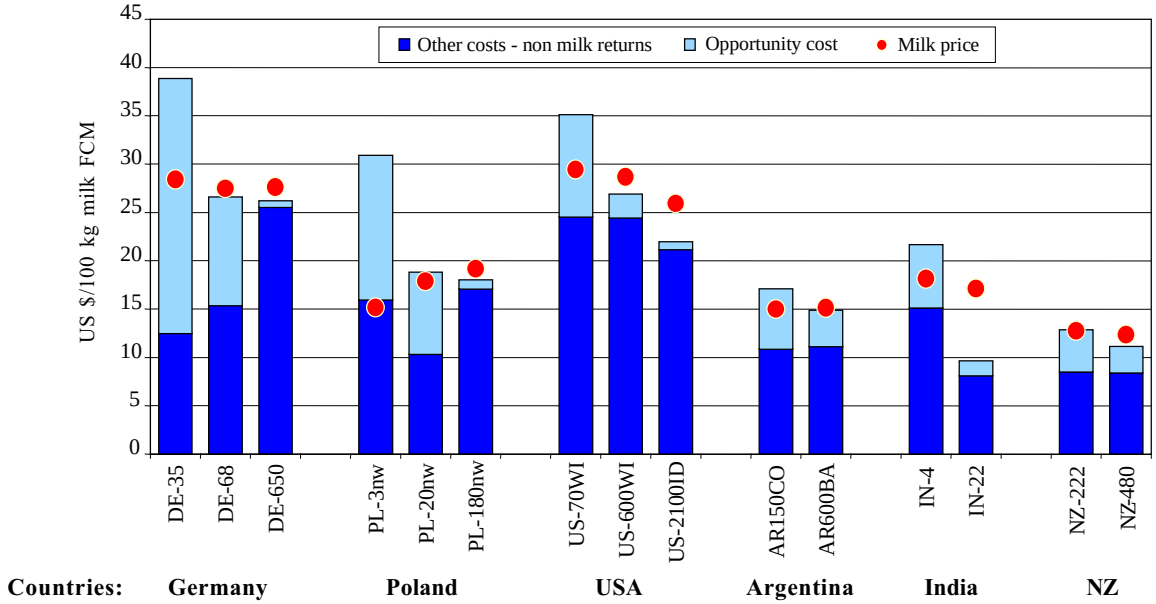

Figure 3. Costs of milk production

Source: IFCN Analysis 2001, data refer to the year 2000

The low cost countries in the Southern hemisphere have a cost advantage of about 50 % against the larger EU and US farms. Their privileged cost levels result from a) the Southern hemisphere production systems without barns (NZ, AR) and b) the very low wage rates (India). In all countries, significant cost differences between the average sized and the larger farms are found. This is a clear indicator for ongoing structural change in the future.

At current milk prices, all farms except the Polish 3 cow – farm are covering their costs from the profit and loss account and achieve a positive family farm income. In the year 2000, however, only the large East German farm, the US farms with 600 and 2 100 cows and the large farms in India (22 cows) and New Zealand (480 cows) were also covering the opportunity costs for family owned production factors. Most average sized family farms do not cover the full economic costs but stay in business as long as the family farm income meet their requirements.

Of course, the economic situation of dairy farming and its competitiveness cannot be sufficiently answered by

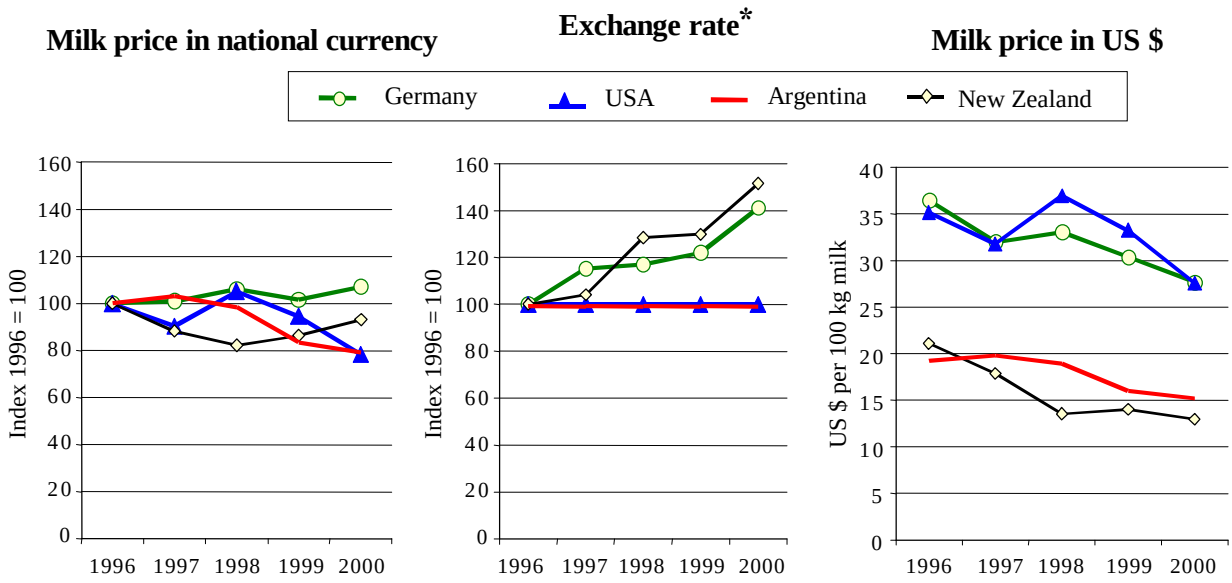

Figure 4. Milk prices 1996–2000

Source: IFCN Analysis 2001, data refer to the year 2000
* US $ to nat currency

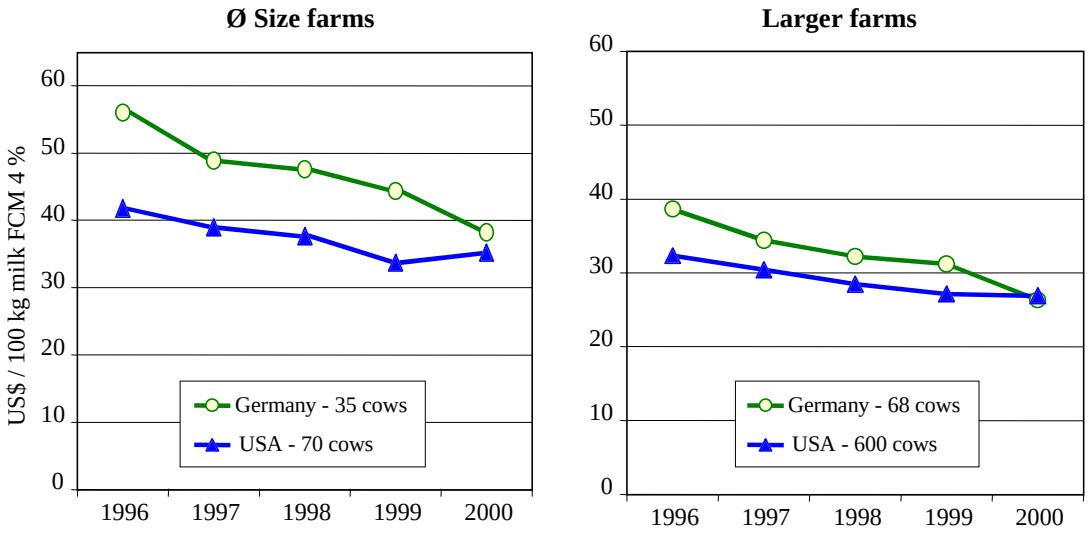

Figure 5. Costs of milk production 1996–2000

Source: IFCN Dairy Report 2001

just analysing one year. Figure 5 shows how drastically have the milk prices in some selected countries changed in the period 1996–2000 and how the relation of milk prices between the countries changed, too. In Germany and New Zealand, the main reasons for the price reduction was the devaluation of the own currency against the US $. Milk prices in national currency remained more or less stable. In the USA and Argentina, the main reason for prices changes was the significant reduction in milk prices for the farmers.

Costs of production have also developed differently in different countries. This is shown for two selected farms (D, US) and the period 1996–2000 in Figure 5. Clearly, the strength of the US $ has over time reduced the cost advantage of the US farms against the German farms. In the year 2000, a typical German 68 cow operation had similar costs as a typical 600 cow farm in the USA. It should be noted, however, that the graph does not only reflect the impact of exchange rate developments. At lot of other reasons play a role as well, e.g. world market developments for certain commodities, the impact of trade policy regulations, tax policy developments, or the introduction of new technologies like BST.

CONCLUSION

The experience has shown that there is a great demand for an international network that regularly analyses typical farms of a certain branch. On the other hand, it is also a challenging task to build a network that gives all participants an adequate incentive for long-term participation.

The IFCN dairy network has already reached a relatively high degree of sustainability. Researchers from 24 countries take part, and the participating countries account for more than 70 percent of world milk production. Once a year, the IFCN Dairy Conference is held and the Dairy Report is published. Organisational and financial arrangements that prove to be successful in the dairy network, shall step by step be transferred to other agricultural branches. The IFCN beef branch has been launched in 2001, and the IFCN crop branch is also on its way.

The results from the Dairy Report 2001 show that there are great differences between the farms and that it can be assumed that these differences will also determine different reaction patterns when the farms are faced with new technologies, changing economic conditions, or different agricultural policies. Currently, the low cost countries in the Southern hemisphere have a cost advantage of about 50% against the larger EU and US farms. In all countries, significant cost differences between the average sized and the larger farms are found. The results also show that the economic situation of dairy farming cannot be sufficiently analysed on a “one year data base”. Hence, in the future, time series analysis will gain importance in the IFCN work.

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