

# CONNECTION BETWEEN HUMAN RESOURCE AND TECHNICAL EQUIPMENT AND IMPORTANCE OF THESE FACTORS IN PRODUCTION

**ANDRÁS VÁNTUS** assistant professor  
**ZOLTÁN HAGYMÁSSY** associate professor

University of Debrecen

Faculty of Agricultural and Food Sciences and Environmental Management  
Institute of Land Utilisation, Technology and Regional Development  
Department of Agrotechnology

## Abstract

Strict economic circumstances necessitate that firms should emphasize cost-effective farming, exploration of possible reserves, usage of available project sources and reduction of costs. Mentioned facts are also valid for inland dairies. Authors examined two dairies' human and technical facilities of productivity and changes of it in a ten-year-long period in Hajdú-Bihar county. Besides, the authors also surveyed sources of performed modernisation. Examinations were made by methodical observation, oral interview and document analysis. As the technical equipment has a significant effect on utilization of working hours and on the number of workers, that is why it is expedient to form indexes of labour productivity, therethrough differences among farms can be marked. Based on the analysis the authors offer a proposal for farms so that they can stay permanently on the market. These proposals have reference to amelioration of labour organisation and to availability of further developmental sources.

## 1. Introduction

Employment and its increase are among the top social economic issues today, not only in Hungary. Also a main concern among enterprises is to decrease their costs. Subsequently, cost planning has a great effect on implementing their actions (Gulyás and Keczer, 2012. p. 63.). Employment costs are a significant part of the total cost, thus work time consumption should be decreased (Bába and Berde, 2010. p. 54; Gergely, 2011. p. 195.), and time efficiency increased (Bácsné Bába, 2010. p. 133.; Juhász, 2011. p. 115.). Efficient work can be achieved by using machines in certain work actions. Other researchers also emphasize on the use of modern technology in farming (Harsányi et al., 2005. p. 179.; Széles et al., 2012. p. 349.; Sulyok et al., 2013. p. 33.). Farmers' goals are cost-effective production and marketing success (Felföldi, 2006. p. 318.; Pakurár, 2012. p. 240.), therefore agro-economic analysis of the enterprise is important. (Sulyok et al., 2013. p. 33.) Technical equipment has a significant effect on utilization of working hours and on work safety (Terjék and Dienesné, 2011. p. 226.).

Competitiveness of the enterprises has a great effect on employment, and this sensitive area should be carefully considered by those who can act against unemployment. A key factor of success is education, which helps the employees effectively fulfil their tasks (Juhász, 2012. p. 215.; Dajnoki, 2012. p. 198.). Trainings can help employees also to fill in different positions and find job easier (Móré and Keszler, 2013. p. 84.). Young employees should acquire up-to-date knowledge that is useful for the employer (Oláh, 2013. p. 37.). In order to reach the above mentioned competitiveness adequate technical back-

ground should be supplied (Pierog and Szabados, 2012. p. 64.), and the production conditions should ensure fulfilment of organizational objectives along with sustainability (Gályász et al., 2013. p. 222.). Sustainability includes protection of environment through proper waste handling. EU funded projects help farmers to improve manure management, animal health and hygienic conditions (I1). These helped the farms to meet the domestic and the European requirements (I2). As the Northern Great Plain is among the regions that are mostly affected by unemployment, our study and results can supply useful information for the professionals to increase employment.

## 2. Material and method

We analysed the number of cows, the human and technical resources in two dairy farms (F1 and F2) in Hajdú-Bihar county. Having earlier records also, we could compare the past and the present situation, and make conclusions about the effects of changed conditions. Data were collected by document analysis, interviews and methodical observation. Following the data analysis we presented our suggestions for making the dairy farms' operation more successful in the future.

## 3. Results

As success of production is best described by the productivity indexes, we present these in *Table 1*. It shows that on farm F1 the number of cows increased with 16% in the past ten years, but the number of workers decreased with 20%. On farm F2 the number of cows increased with 21%, but the number of workers grew only with 11% in the past 10 years. Milk production per cows stayed constant on farm F1, but increased with 13% on farm F2. This is noticeable because increased quantity with constant quality level indicates the improvement of management. Number of cows per physical workers increased with 31% and 9% on farms F1 and F2, significantly. Number of work hours per cows decreased with 31% and 9% on farms F1 and F2, significantly. Number of work hours per 100 litres of milk decreased with 28% (F1) and 22% (F2) on the farms.

**Table 1. Change of data and labour efficiencies on studied farms between 2003 and 2013**

	F1		F2		F3	
	2003	2013	2003	2013	2003	2013
Number of workers	34	27	18	20	12	16
Number of cows	532	616	330	400	380	540
Total milk production per year (litres)	3 845 000	4 450 000	2 114 000	2 930 000	2 786 000	3 600 000
Number of cows per physical workers	15.65	22.81	18.33	20.00	31.67	33.75
Work hours per cows (hours/year)	133.32	91.43	113.78	104.30	65.87	61.81
Work hours per 100 litres of milk	1.8	1.3	1.8	1.4	0.9	0.9

*Source:* Personal research (2013)

We can state that all indicators improved on both farms, but the example of farm F3 – presented here only for comparison – shows that development possibilities are still ahead of them. The improvements are resulted from a common effect of several factors – here we analyse two of these: the qualification of the employees and the sources and types of

technical investments. At first we present the changes if the workers' qualifications according to the positions (Table 2 and 3). The data in the cells refer to the number of workers in 2003/2013 years.

**Table 2. Change of qualifications on farm F1 between 2003 and 2013**

	Primary school	Non-farming secondary school	Farming secondary school	High-school graduate	Farming high-school graduate	College graduate
Milker	3/0	1/6	1/0	1/0	1/0	0/0
Cow carer	2/0	2/0	2/3	0/0	0/0	0/0
Calving assistant	1/1	1/1	1/1	0/0	0/0	0/0
Parlor assistant	0/0	1/2	0/0	0/0	0/0	0/0
Parlor assistant – driver	0/0	2/0	0/0	0/0	0/0	0/0
Milk handler	2/0	0/0	0/0	0/0	0/0	0/0
Inseminator – team manager	0/0	0/0	2/1	0/1	0/0	0/0
Repairman	0/0	1/0	1/2	0/0	0/0	0/0
Tractorist	0/0	5/3	0/0	0/0	0/0	0/0
Feeding tractorist	0/0	0/1	0/0	0/0	2/1	0/0
Calf carer	1/0	0/1	0/0	0/0	0/0	0/0
Substitute worker	1/0	0/0	0/0	0/0	0/0	0/0
Driver	0/0	0/1	0/0	0/1	0/0	0/0
Administrator – cleaner	0/0	0/0	0/0	0/1	0/0	0/0

Source: Personal research (2013)

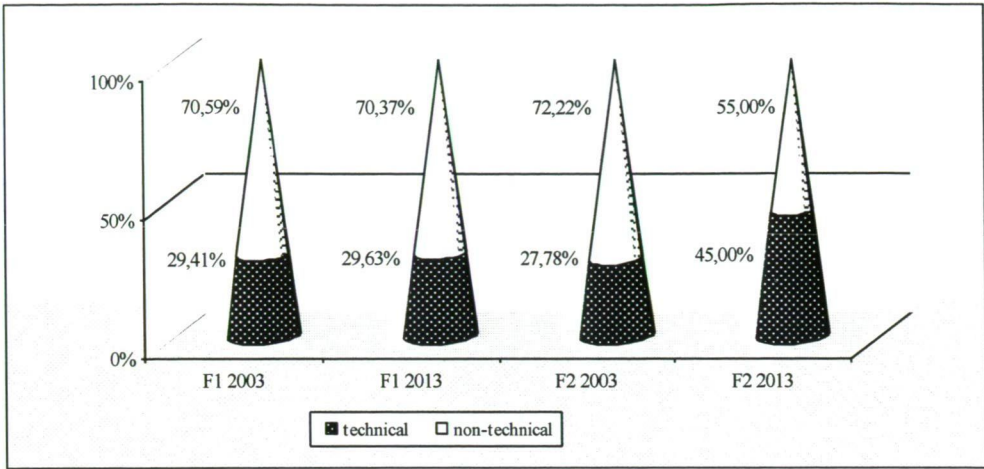
**Table 3. Change of qualifications on farm F2 between 2003 and 2013**

	Primary school	Non-farming secondary school	Farming secondary school	High-school graduate	Farming high-school graduate	College graduate
Milker	0/0	1/1	1/2	0/0	1/0	0/0
Cow carer	0/0	1/1	0/0	0/0	0/0	0/0
Calving assistant	1/0	1/1	1/2	0/0	0/0	0/0
Parlor assistant	0/0	1/1	0/0	0/0	0/0	0/0
Milk handler	0/0	1/2	1/0	0/0	0/0	0/0
AI assistant	1/0	1/2	0/0	0/0	0/0	0/0
Repairman – team manager	0/0	0/0	1/1	0/0	0/0	0/0
Tractorist	1/0	1/1	0/2	0/0	0/0	0/0
Feeding tractorist	0/0	2/0	0/2	0/0	0/0	0/0
Substitute worker	1/1	0/1	0/0	0/0	0/0	0/0

Source: Personal research (2013)

Workers' qualification did not change significantly on farm F1, but improved with 17.22% on farm F2 (Figure 1). We must note that there are more types of jobs on farm F1, than on F2, but workers on farm F2 have combined positions. Although the rate of qualified workers is higher on farm F2, workers on F1 have more practical experience that can contribute to the farm's good production results.

**Figure 1. Comparison of workers' qualifications on farms F1 and F2 between 2003 and 2013**



Source: Personal research (2013)

It is noticeable that the workers took part in several trainings. 3 workers acquired tractor driving license, 4 acquired heavy equipment operator license, 2 got inseminator license and 1 got cattle foot trimmer license on farm F1. 1 worker completed milk hygiene training, 2 completed machine milker training, 1 got equipment operator license and 1 got loader equipment operator license on farm F2.

Not only human resources but technical equipment also has a great effect on labour efficiency. Therefore it was necessary to study the financial sources of technical investments.

The farms are concerned about it, so they have fund seeker employees. Also they have contracted fund seekers and technical writers. In the past ten years both farms applied for 2 funds successfully. They used 100% of the granted sum.

Development inputs exceed 450 million HUF on both farms (Table 4), that was used for buildings and roads, manure handling and machine and equipment purchase. Granted sum is almost double on farm F1 compared to F2, but farm F2 invested 40% more own financial source.

F1 invested the most in equipment purchase, while F2 in manure handling. The smallest but still significant amount was used for buildings and roads.

Technical investments involved milking system modernization on farm F1 (they fitted automatic cup retractors) and modernized the automatic drinkers. They also purchased 3 tractors, 3 trailers, 1 loading machine and 1 silage tube wrapper. Safe manure storage also required a great investment. The same fund was used to modernize the stable, build a forage store and renovate the roads on the farm.

The highest sum was spent on safe manure storage on farm F2, but most of it was from own source. They used own investment for machine and equipment purchase also.

**Table 4. Areas of development and sources of investment on the studied farms**

	F1		F2	
	Funding (HUF)	Own source (HUF)	Funding (HUF)	Own source (HUF)
Buildings and roads	6 000 000	19 000 000	15 160 000	34 740 000
Manure handling	56 250 000	18 750 000	36 800 000	55 200 000
Machinery and equipment	40 000 000	86 300 000	0	85 000 000
Total	102 250 000	124 050 000	51 960 000	174 940 000
<b>Total all</b>	<b>452 600 000</b>		<b>453 800 000</b>	

Source: Personal research (2013)

This way they purchased 1 tractor, 2 loader machines and 3 trailers. Building modernization included cow stable restructuring and roof renovation. On the top of the stable they equipped 2 solar collectors that produce the warm water for cleaning the milking machine. Roads on the farm were renovated from own financial source.

#### 4. Conclusions, suggestions

1. We concluded that the long existing enterprises increased their number of cows, so plan to continue production in the future.
2. Rationalization helped to continue production through improving labour efficiency.
3. One factor that helped to increase productivity indexes was continuous technical improvement.
4. Technical developments were financed from EU funds and the farms' own sources.
5. At the same time the farms met the European and domestic professional requirements.
6. The investments promoted the sustainable development, concerning protection of the environment.
7. The farms contributed to the population retention of rural communities through developing their technical facilities and human resources.
8. These two factors interacted in the marketing stability of the farms.
9. In order to maintain their competitiveness in the long run, the farms must exploit the possibilities remained in their organisational structures.
10. It is advisable to apply for funds during the 2014–2020 EU budgetary period, as well.

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