

Profitability of and Reasons for Adopting Automatic Milking Systems

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Paper prepared for presentation at the XIth Congress of the EAAE

(European Association of Agricultural Economists),

'The Future of Rural Europe in the Global Agri-Food System'

Copenhagen, Denmark August 24-27, 2005

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Abstract

Adopting an automatic milking system (AMS) on a dairy farm decreases the hours spent on animal husbandry by approximately 30 per cent. When comparing a milking parlour and the AM-system, the main economic benefit clearly results from the decrease in labour costs in automatic milking. In terms of economic profitability, the net profit in AM-system remains above that of the milking parlour system. On dairy farms the main reasons for adopting automatic milking are linked to the workload and physical loading. A more flexible working time distributes the workload evenly during busy cultivation periods. More flexible leisure time is also important. Producers also want to enhance the welfare and health of the animals by increasing the milking frequency of highly productive cows.

Keywords: automatic milking system, profitability, labour costs

JEL classification: Q12, Q16

1. Introduction

The first AM-systems were implemented in Finland in 2000. At the end of 2004, some 100 AM-systems have been installed. Moreover, according to FADN farms' future plans there will be AMS at 1 700 Finnish dairy farms in the next ten years.

Automatic milking system requires a higher investment than conventional milking system. However, at the same time farms have increasing pressure to decrease unit costs in production. Thus the need for an economic analysis of AM-system is obvious. The aim of our study is to find out (1) what are the investments that AM-system requires, (2) what are the cost of these investments, and (3) how these investments affect to the total costs and profitability of farms?

The data was gathered by conducting a survey on AMS-farms. At the time of survey there were 56 AMS-farms of which 29 answered to our survey. In addition three of the farms were interviewed.

2. Labour saving on average 30 % in AM-system

On most of the farms the working hours spent to animal husbandry decreased remarkably when adopting AMS. In this study, annual working hours spent to animal husbandry were approximately 117 hours/cow/year before AM-introduction when a farm has approximately 40 dairy cows. An adoption of AMS decreased working hours to 73 hours/cow/year. Worth noticing is that there is still a great variation in time of work between dairy farms.

Compared to other European countries the labour costs per cow are high in Finland as the labour input per dairy cow is considerable. According to Patjas (2004) the total labour input on dairy farms in Finland reached up to 284 hours per dairy cow, which was twice the amount employed on the Swedish farms (142 hours) and several times that on Danish (60 hours) and German farms (78 hours). This is related to the obvious differences in production structure between studied regions, as farms are typically larger in Sweden, Denmark and Germany than in Finland. Furthermore production conditions evidently demand different types and amounts of work (Patjas, 2004).

In the same time, we should take into account the increasing number of milking cows, which also decreases time of work per cow. By means of FADN bookkeeping data we could count that 12 hours of the total reduction was based on the scale effect. Thus as a result the decrease from 105 to 73 hours can be considered purely as a "new technology effect". On a Finnish dairy farm labour saving after investing in an AMS was therefore on average 30 % (figure 1). This reduction is bigger than an average labour reduction of 21 % in other AM-studies (Wauters and Mathijs, 2004).

3. Introduction of AM-system is economically profitable

The profitability of AMS is assessed by comparing returns and costs per cow in milking parlour system and in the AM-system. The calculations were made for 60 cow herd. Based on our data milk returns are assumed to remain the same in both systems. Furthermore, milk quality maintained

unchanged in nearly all dairy farms after AM-adoption. So we assumed that shifting to AMS does not have an economic impact on milk returns. Feeding costs are also assumed to remain the same.

The investment costs are different between AM-system and milking parlour system. The price of 1-box system is on average 127 000 €(VAT 0 %) in automatic milking. As alternative milking parlour system we considered 2*3 autotandem milking system that costs approximately 31 000 € In both systems building cost of a new cowshed for 60 cows was calculated by means of the official Finnish building directive. Smaller space requirement in AM-system decreases the cost of a new cowshed approximately 11 000 € Both the AM-system and the milking parlour system are depreciated linearly over 10 years for machinery and over 25 years for farm buildings. Interest rate of 5 % is used, but when the investment support is taken into account the interest rate of 2 % is feasible.

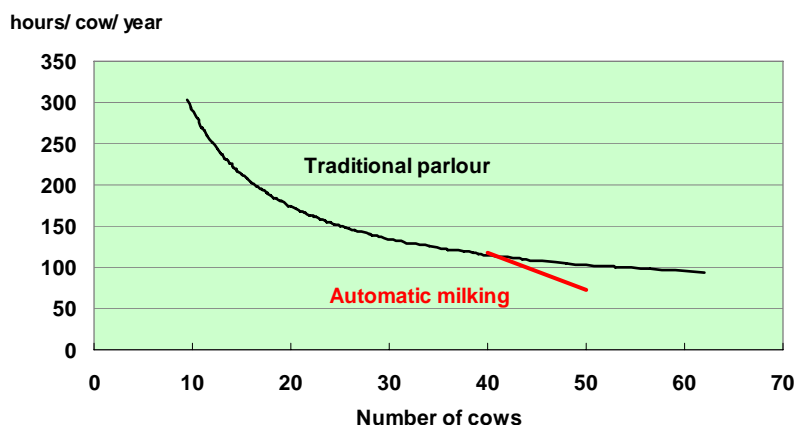


Figure 1. The effect of AM-adoption to the time of work in animal husbandry.

The main economic benefit clearly results from the decrease in labour costs in automatic milking system. When a wage requirement 11,3 €/per hour is used, difference in labour costs is beneficial to AM-system over 300 €/cow.

The cost effect of depreciation for machinery is 161 €/cow/year higher in AM-system, whereas depreciation of farm building in AM-system is 10 €/cow/year less. After calculating returns and costs of both system we can conclude that in terms of economic profitability, the net return in AM-system remains almost 100 €/cow above that of the milking parlour system. Due to the large variation in costs, sensitivity of the results was also analysed.

4. Motivations of AM-adoption

Mathijs (2004) found social reasons to be more important reasons than economic ones for AM-adoption in those countries they studied. In our study results are similar, since the main reasons for adopting AMS were linked to the workload and physical loading. A more flexible working time distributes the workload evenly during busy cultivation periods. More flexible leisure time is also important. The reduction of labour demand and consequently labour costs is also an economic reason for AM-adoption. With AM-adoption producers also want to enhance the animal welfare by increasing the milking frequency of highly productive cows.

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