A Study Of Determination Energy Costs And Factors Affecting The Energy Efficiency For Milking Mechanization

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***Abstract*—Determination of electric energy efficiency for milking mechanization is aimed in study. After determination of milking and cooling systems utilization rate and daily average electric energy utilization, energy efficiency parameters were calculated for each farm for this aim. Energy efficiency parameters are; specific electric energy consumption, electric energy productivity and electric energy cost ratio. The trial were done at three different dairy farm located in Tekirdağ Area. Since milking and cooling systems are much more utilization systems in the farms, data collected from these systems were used as a represent of the farm energy efficiency. Electric analyzer devices were set at these systems for a month in the same duration. The device was recorded instant electric consumption and recorded. According to results; percentage of total milking and cooling system was found to be 63% in farm A, 54% in farm B. Daily average electric energy utilization values with 270,55 kWh, 72,12 kWh and 44,55 kWh were determined in Farm A,B and C respectively. Specific electric energy consumption for Farm A was calculated as 0,046 kWh/l and 1,26 kWh/cow for Farm B, 0,075 kWh/l and 1,563 kWh/cow, 0,159 kWh/l and 2,624 kWh/cow for Farm C. Electric energy productivity was found to be 112,74 l/kWh for Farm A, 53,34 l/kWh for Farm B and 30,21 l/kWh for Farm C. Rate of electric energy cost in Farm A was 1,6%, in Farm B 2,6% and 2,6% Farm C.**

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***Keywords*—energy efficiency, dairy darm, energy management,**

I. Introduction

Energy efficiency covers all the effectiveness studies related to energy production, energy transformation, energy transmission and energy consumption. The Increase in energy costs due to limited fossil energy sources, requires applications related to the efficient use of energy to increase the country's welfare and reduce dependence on foreign economy. Determination of the level of energy efficiency and improvement in all areas is needed as a priority.

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Nowadays, national and international studies are carriyed out related to energy efficiency on a sectoral basis. There are benefits of the assessment on a sectoral basis, such as

-Determining the environmental impacts that occur during utilization of energy resources,

- Ensuring that more efficient use of energy resources,
- Determining of the value, type and place where the waste and losses in the energy system,
- The reduction of inefficiencies in existing energy systems, the development of effective design methods
- Providing sustainable development with the use of energy resources in a sustainable way
- Determining the usage areas of high and low quality energy sources and priorities in terms of utilization,
- Identifying areas for improvement by taking advantage of effective technology [1].

The concept of energy density is used and accepted worldwide as one of the most important indicators of energy efficiency. This concept is the amount of primary energy consumption per gross domestic product. The average energy density of our country is approximately two and a half times the European Union, twice the Organization for Economic Cooperation and Development countries [2].

According to the data of our country in recent years [3], increase in energy efficiency is observed in the services and industrial sectors, but gradual decrease is observed in the agricultural sector. It is clear that the measures are insufficient for the agricultural sector when examined on a sectoral basis. It is necessary to accelerate energy efficiency efforts in the both crop and animal production areas to reduce the effect of increasing the total energy demand of the agricultural sector.

Electrical energy is widely used in agricultural production as well as in other fields because of the environmentally friendly and ease of transmission and use. Majority of studies are related to energy efficiency in crop production and studies in animal production are insufficient.

When the animal production systems examined; electricity consumption is high because of mechanisation and automation level. Electrical energy cost is emerging as a significant energy input for enterprises depending on rising of energy costs.

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