

## The Effect of Magnetic Water Treatment on Milk Fat and Somatic Cell in Dairy Cow Production

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**Abstract.** Nowadays magnetic water system becomes popular in the world. Magnetic water is water that has been induce with magnetic field and could be used as a stimulator for growth reaction. Many people used magnetic water for germination in plant cultivation or dairy. In this study will explain about effect magnetic water treatment for dairy milk cow production. For known the effect of magnetic water we must analysis milk fat and somatic cell. This period of experiment is 2 year in 2014 and 2015 In April-September 2014 without magnetic water and April-September 2015 with magnetic water. From these results it can be seen that the provision of magnetic water continuously can provide added value for milk production. The magnetic water treatment affects both an influence on the water. The average increase in the amount of milk production after using magnetic water is equal to 16.5% -17.58%

**Keywords:** Magnetic water, milk fat, somatic cell

### 1 Introduction

Donaldson cited the magnetic technology investigated the turn of the 19th. The technology is mixed with chemicals in all sorts magnetic mineral. Nowadays, advances in magnetic and electrostatic scale control technologies have led to their becoming reliable energy savers in certain application [1]. The principle from the magnetic water treatment is used a Lorentz force, the water passes through a magnetic water softener, a Lorentz force is exerted on each ion which is in the opposite direction of each other[2]

Water is a major component of plants and animals and is the main medium for biochemical reactions. A water characteristic has a close relation to its molecular structure [3].

Milk production per cow is extremely high and technological inputs are high. At the other extreme are systems which are used by the vast majority of small farmers in developing countries and are based on low inputs and productivity per cow is relatively low [4].

Changes in milk composition are more related to feeding factors than to genetic ones; hence for better correlations among variables (composition) the food intake is

more important than the content of nutritive [5]. Feed is one important thing, but it is also supported by the provision of drinking regularly. Therefore the aim of this paper is to know the effect of magnetic water treatment in dairy milk cow.

## 2 Material and Methods

### 2.1. Installation

Installations of magnetic instrument in the pipelines system were automatically cleared and the solid material became loose and fell off. Installation can see in Fig 1



Fig 1. Installation of magnetic instrument

### 2.2. Treatment and Analysis

The monitoring was carried out on 2 cow cage in Miryang City South Korea. The period April-September 2014 and April-September 2015 was taken the data. In the period April-September 2014 cow did not bring the magnetic water treatment (Non-treatment) and period April-September 2015 bring the magnetic water treatment (treatment). Every day cows bring water for drink, for treatment each cow cage given the magnetic water for treatment can see **Error! Reference source not found.** Analysis required in this experiment is milk fat, milk protein, and somatic cell.

### 2.3. Principle of magnetic field

Magnetic water treatment works on the principle that as water passes through a magnetic water softener, a Lorentz force is exerted on each ion which is in the opposite direction of each other. The redirection of the particles increases the frequency of collisions between ions of opposite sides, combining to form a mineral precipitate or insoluble compound

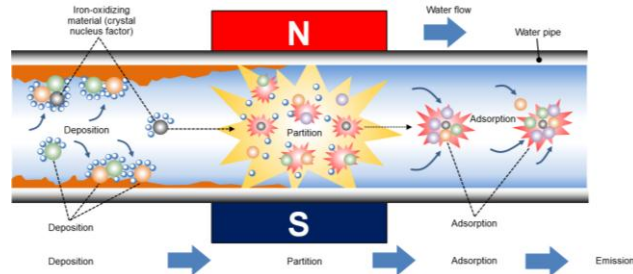


Fig. 2. The principle of magnetic water device

### 3 Results and Discussion

#### 3.1. Milk Fat and Protein

At cage 1 and cage 2 all of cows were assigned to the treatment of magnetic water in period April until September 2015 and un-treatment in period April until September 2014. In the Fig. 3 can be seen the milk fat in the first cow cage without magnetic water (2014) have a high percentage than used magnetic water treatment (2015) as well as Fig. 4 in second cage. In the Fig. 4 the milk cow used magnetic water (2015) more low than without magnetic water treatment (2014). From the FAO (Food and Agriculture Organization of the United Nations) fat from the cow milk constitutes approximately 3 to 4 percent of the solid content of cow milk. So cow milk with magnetic water treatment has a fat better than without magnetic water treatment.

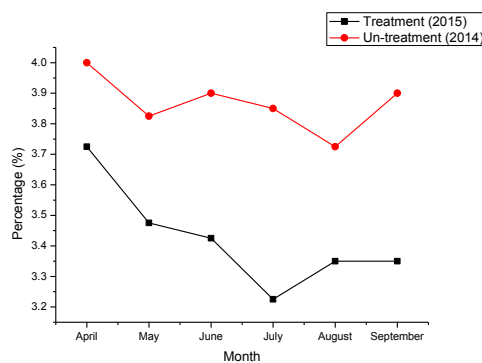
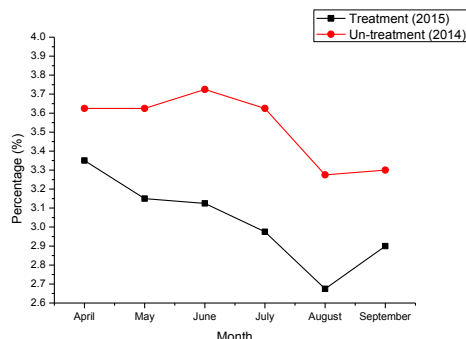


Fig. 3. Milk fat in cow cage 1



**Fig. 4.** Milk fat in cow cage 2

### 3.3. Somatic cell and total milk

Somatic cell count is usually utilized as a sanitary control of milk. Somatic cell and milk production in first cow cage and second cow cage in **Table 1**. Somatic cell and milk production in cow cage 1 and **Table 2**. Somatic cell and milk production in cow cage 2

used magnetic treatment more low than un-treatment. In the table can be seen the milk production decreased, the somatic cell will increased. From the somatic cell and milk production, magnetic water treatment will make the milk production increased and make the somatic cell decreased. **Fig. 5** and **Fig. 6** can be seen the total milk from the cage 1 and cage 2, from the diagram can be seen that the increase of the amount of milk produced in cage 1 an average of 16.5% and in the cage 2 can be seen that increase amount of milk produced an average of 17.58%.

**Table 1.** Somatic cell and milk production in cow cage 1

Mounth	Somatic Cell ( $\times 10^3/\text{ml}$ )		Milk Production (Kg)	
	Treatment (2015)	Untreatment (2014)	Treatment (2015)	Untreatment (2014)
April	149.75	157.5	10655.4	9474.925
May	156.5	133.75	10826.38	9663.875
June	124.5	203.5	10237.25	8890.15
July	156	180.75	10132.33	8453.175
August	190.25	273.25	9371.4	7644.5
September	225	209.5	9368.625	7589.4

**Table 2.** Somatic cell and milk production in cow cage 2

Mounth	Somatic Cell ( $\times 10^3/\text{ml}$ )	Milk Production (Kg)
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	Treatment (2015)	Untreatment (2014)	Treatment (2015)	Untreatment (2014)
April	125	176.5	11732.9	10732.05
May	116	210.5	12045.4	10463.83
June	141	181.5	12057.15	10787.13
July	139.75	264.5	12834.3	10519.88
August	120	158.25	12441.48	9330.15
September	134.5	151.25	11274.35	8590.65

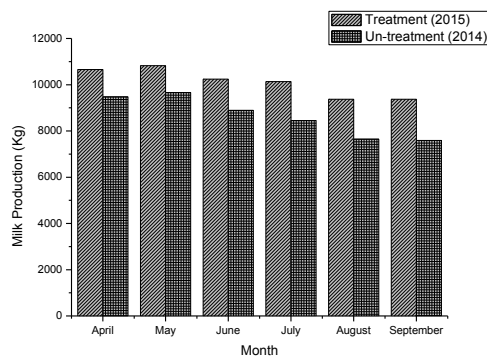


Fig. 5. Total milk production in cow cage 1

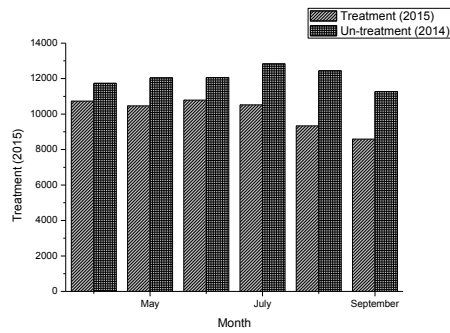


Fig. 6. Total milk production in cow cage 2

#### 4 Conclusion

The result mainly confirmed that the magnetic water effective to dairy milk cow production. In the milk cow used magnetic water more better than without magnetic water treatment. Somatic cell in this experiment used magnetic treatment more low than un-treatment. The average increase in the amount of milk production after using magnetic water is equal to 16.5% -17.58%

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