



## Research article

### The beneficial effects of magnetically treated Water on weight gain, meat quality and animal health for Friesian calves

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#### Abstract:

*The study was carried out on twenty-four Friesian calves aged 4-5 months of weights 115-125 kg. The study aimed to knowing the Effect of magnetically treated water in some blood parameter and the influence of these changes on animal health, quality and quantity of produced meat. In the experiment the calves were distributed into two groups: /8/ ones in each. All these animals were feeding with same feedstuff and the calves in the first group were watered with normal water (As control group), while the calves in the second group were watered with extremely magnetically treated water /1000/ Gauss. The experiment continued for six months and the calves were weighed once a month and blood samples were analyzed from all animals in the experiment. The results showed a significant increase ( $P < 0.05$ ) in the count of red blood cells, hemoglobin and hematocrit and an increase in the count of white blood cells ( $P < 0.05$ ) in the second group. The results have shown a decrease in the level of cholesterol and Triglyceride and the level of weight gain of calves in the second group overweighed on average /131/ g daily. Besides, the results refer to improvement in the physiological and healthy conditions of the animals and production of higher amounts of meat as well as producing more healthy meat with lower content in cholesterol and Triglyceride.*

**Keywords:** Blood Parameter, Calves, Gauss, Magnetically treated water.

#### Introduction:

Water has an important role in all vital processes as it is considered significant in blood circulation and a medium for all chemical interactions (1). When water passes in a magnetic field, its properties change from normal to active and fertile that lead to rise in oxygen proportion (2). Due to development in the scientific researches, scientists realized that treating water with a magnetic field results in important changes in its properties, it becomes more absorbent by the cell because the molecules of water decompose faster, because water consists of a big number of molecules known as (Cluster) that may reach /280/ ones or more (3). Water properties are influenced on passing a magnetic field and when it is drunk blood is affected in the same way where it ionizes and

flows easily that activates blood circulation (4).

Normal water has a pH level of about 7, whereas magnetized water can reach pH of 9.2 following the exposure to 7000 gauss strength magnet for a long period of time (5). Water solution passes through magnetic field acquire finer and more homogeneous structures, which increases the fluidity, dissolving capability for various constituents like minerals and vitamins and consequently improves the biological activity of solutions, affecting positively the performance of animals (6).

#### Research Goal:

- 1- Knowing changes in blood parameters when using magnetically treated water for Friesian calves drinking.
- 2- Effect of these changes on animal health.



3- Effect of magnetically treated water on quality and quantity of produced meat.

## Materials and Methods:

### Ethical approval:

On the proposal of the Council of the Faculty of Veterinary Medicine to approve this study under permission No: 93. The University of Hama Council approved the under permission No: 510.

The experiment was carried on a private farm for calves in Aldahrieh district in Hama, Syria during the period from 1/8/2018 to 1/2/2019. The study involved /16/ Friesian Holstein calves of convenient weights (115-125) kg and were distributed into two equal groups. All the calves were in a good health, free from diseases and subject to veterinary supervision continuously. Experiment animals were put in adjacent semi-open sheds in the same feeding and environmental conditions and one kind of fodder was offered to all groups studied, drink water was offered to each group according to table (1).

**Table (1): Distribution of experiment groups.**

Group	Experiment Animals	Drink Water
First (Control Group)	8 calves	Normal water
Second	8 calves	Magnetically treated water with 1000 Gauss

Magnetically treated water sets were installed before water reaches drinking places and

### Results:

Firstly: Healthy & Physiological Condition of an animal:

The experiments elaborated in (chart 2):

a- A significant increase ( $P < 0.05$ ) in the count of red blood cells, hemoglobin and hematocrit in the group magnetically treated water.

b- An increase in the count of white blood cells (WBC) ( $P < 0.05$ ) in the same group.

plastic pipes were used and magnetically treated water was given to the experiment animals in plastic containers to ensure that the metal is not affected by magnetically treated water, also, the drinking places were evacuated to renew the water every 8 hours periodically to preserve the properties of magnetically treated water while continual compensation with water. Water was analyzed in the two study groups, the magnetically treated water showed an increase in pH towards alkalinity from /7.5/ in tap water to /7.8/ in magnetically treated water. Blood samples were collected individually once every month from the jugular veins of the experiment calves to analyze blood and were put in sterile tubes that contain anti-coagulation material (EDTA) and heparin. Blood analysis was carried out at the labs of Veterinary Medicine Faculty, Hama University.

The following Parameters were analyzed:

- 1- Red blood cells (RBC's)
- 2- Hemoglobin (HGB)
- 3- Hematocrit (HCT)
- 4- White Blood Cells (WBC's)
- 5- Cholesterol
- 6- Triglycerides

The experiment animals were weighed once a month during the experiment; The results were analyzed using The one-way analysis of variance (ANOVA) using Statistical Analysis Program (SPSS 20) after ensuring that the data were distributed in a homogeneous manner.

**Table (2): The effect of magnetically treated water on some blood elements**

Element Studied	Unit	Control Group	Magnetically Treated Water Group
RBC's	106/ul	$5.61 \pm 0.08$	$6.29 \pm 0.06$
HGB	g/dl	$7.75 \pm 0.38$	$8.7 \pm 0.28$
HCT	%	$21.67 \pm 0.25$	$24.92 \pm 0.34$
WBC's	103/ul	$10.71 \pm 1.08$	$13.17 \pm 0.88$



Secondly: Quality and Quantity of Produced meat:

a- Through blood analysis, the produced meat was distinguished with a decrease in general cholesterol and triglycerides.

Table (3): The effect of magnetically treated water on meat product.

Element Studied	Unit	Control Group	Magnetically Treated Water Group
Cholesterol	mg/dl	252.75± 3.1	207.5± 5.2
Triglycerides	mg/dl	45.75± 2	39.25± 2.9

b- The level of daily weight gain of the experiment calves showed the following results:

- The superiority of magnetically treated water group in general weight at the end of the experiment to the Witness Group

- The ratio of daily weight gain of calves was better in magnetically treated water group at the rate of /131/ g daily.

Table (4): Rate of weight gain of calves.

Weight/kg	Control Group	Magnetically Treated Water Group
At the beginning of experiment /kg	120± 5.3	124± 4.1
At the end of experiment /kg	265± 4.8	294± 5.7
Daily average weight gain during the whole experiment /g	819± 15	950± 19

## Discussion:

a- The increase of red blood cells, hemoglobin and hematocrit is attributable to the increase in intensity of magnetically treated water that attracts iron in the blood and the blood is pumped in bigger amounts to the area. That means an increase in the count of red blood cells and hydrogen in blood, which leads to transferring oxygen to cells (7, 8). The high concentration of hemoglobin in animals treated with magnetically treated water can be explained in two directions. The first concerns the effect of magnetically treated water in the blood to make it more capable of equipping the body, its cells and its various glands with the appropriate nutrition to perform its function at its best, thus increasing the ability of organs and tissues producing blood such as liver And spleen and bone marrow on the production of blood and the increase of Hemoglobin blood implicit, because the blood contains a large amount of water, magnetization of blood water through the treatment of magnetically treated water will be reduced to his wife increased blood flow through blood vessels increased Hemoglobin

(9).The second is that exposing the water to a magnetic field increases its ability to dissolve the oxygen. This, of course, is reflected in the blood of the animals that have treated the magnetically treated water as it will be able to carry oxygen and the latter is necessary for the formation of hemoglobin, which leads to increased rates in animals (10). These results were consistent with the result of Al-Nuemi (11), who observed a significant increase in the number of red blood cells and concentration of hemoglobin when using magnetically treated water in bulls

b- White blood cells form an important part of blood, The significant increase in the values of white blood cell count indicates that magnetically treated water enhances the rate of formation of white blood cells by stimulating the growth of the lymphatic tissue found in the bone marrow responsible for the proliferation of protective white blood cells that perform phagocytosis, Bacteria and foreign objects in the liver, spleen and vascular lining of the blood vessels, which has the functional role of raising the cellular immune level of the body and increase the



immune globulins (12). This finding indicates the importance of magnetic therapy in raising the efficiency of the immune system and improving animal health (13)

**c-** The decrease in the values of cholesterol and triglycerides in plasma is due to an increase in the activity of the pituitary gland which secretes thyroxin hormone that is

responsible for cholesterol metabolism and reducing its level in blood plasma and increasing the capability of liver to dispose it in the bile (14). Low blood cholesterol leads to the production of healthy meat low in cholesterol content and excels in body weight, feed consumption and metabolism (15).

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