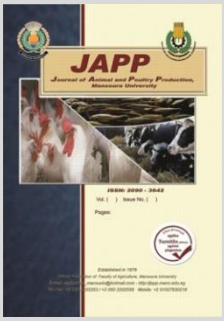
Journal of Animal and Poultry Production

Journal homepage: www.japp.mans.edu.eg
Available online at: www.jappmu.journals.ekb.eg

Effect of Using Magnetic Water on Milk Production and Its Components in Buffalo Cows

Ghoneim, M. M.*; Sh. M. Shamiah; H. M. El-Ragalaty; M. M. Hegazy and R. M. Hassabo

Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture, Dokki, Giza, Egypt



ABSTRACT

The aim of this study was to determine the effect of magnetic water on the milk yield and composition of buffalo cows. Twenty buffalo cows within 4-5 parity and 490-520 kg live weight were divided into two groups (10/group). Animals in the first group (G1) drank magmatic water with 1200 Gauss permanent magnet, while animals in the second group (G2) drank nature water (NW). Milk yield was recorded individually in each group biweekly. Milk composition and white soft cheese manufacturing were determined after 6, 10 and 14 weeks of lactation period. Results revealed that water quality was improved by exposing to the magnetic field. Milk yield from buffalo cow drinking magnetic water was significantly ($P<0.01$) higher starting at 6 up to 14 weeks of lactation than buffalo consumed nature water (NW). The interaction effect between treatment and lactation week indicated higher contents of protein, lactose, solid not fat and ash in milk of cows drank magnetic water. Type of drinking water or lactation week and their interaction had no effect on sensory properties of cheese produced from milk. In conclusion, buffalo cow consuming magnetic water at 1200 Gauss improved milk yield and composition, but no changes were detected for drinking magnetic water on organoleptic scores of cheese produced from their milk.

Keywords: Egyptian buffaloes, magnetic water, milk production.

INTRODUCTION

Water is para-magnetic meaning that it holds a magnetic charge. Para-magnetism occurs mainly in substances in which a few or all of the individual molecules, atoms, or ions own a stable magnetic dipole instant. Ikezoe *et al.* (1998) reported that water has a dipole instant and is, consequently, subject to para-magnetic. Ovchinnikova and Pollack (2009) say, in nature, the earth's magnetic field naturally charges water in wells, lakes and running streams. Water treated with magnetic fields restores to balance that nature intended and the natural energy.

Water and life are strongly related; water is the blood of life. It is required to carry compounds by the blood, regulate temperature and keep cellular structural reliability (Reuter, 2004). Many researchers studied the negative changes in natural water after sterilization and called this water (dead water), thus transferring magnetic water from dead to live (Batman ghelidj, 2005). Magnetic water means the passage of water from magnetic tubes by placing magnets in water so that water's properties become very fertile and active, causing a high oxygen ratio, speed of dissolution of salts and amino acids in water (Batmanghelidj, 2005). Increased water penetration and versatility (Davis, 2004), and body water absorption can decrease superficial water binding (Szkatula *et al*., 2002).

Many researchers have found that magnetized water (MW) use has increased farm yields from 5 to 30 per cent anywhere. Cows drinking magnetized water produced more milk than cows drinking untreated water, and were healthier. Sheep produced more meat and wool, hens laid more eggs and all farm animals survived longer when magnetized water was drunk (David, 1995).

Some studies have been done on animals. Lin and Yotvat (1990) concluded that milk cows drinking MW showed an increase in the production of milk with the same amount of milk fat compared to cows drinking non-magnetized water. Chicken supplied with magnetic water also grew larger, with the meat-to-fat ratio increased (Gholizadeh *et al*., 2009). Rashid *et al*. (2009) reported that MW significantly improves the titer of antibody against new castle and gumbouro disease in fawbro broilers.

Shamsaldain and Al Rawee (2012) suggested that milk production from Awassi sheep was increased when they drink magnetic water intensity (1000 gauss) compared to tap water. Improvement in milk yield was associated with an increase in fat and protein production (Al-Jack 2001)

Organoleptic properties and chemical composition of labneh (Zabady) from goat milk drinking magnetic water are higher than that obtained from control group (Yacout *et al*., 2015)

No available information about effect of magnetic water on milk yield and its components in buffalo cows.

Therefore, amid of this study to investigates effect of magnetic water on milk production and its components in buffalo cows.

MATERIALS AND METHODS

The present study was carried out at Animal Production Research Station, Mahllet Moussa, Kafer El-

* **Corresponding author.**
E-mail address: massoudghoneim@gmail.com
DOI: 10.21608/jappmu.2020.123626

sheikh Governorate, Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture during the period from April to July 2018.

In these experiment, 20 buffalo cows within 4-5 parity and with average live body weight of 490 – 520 kg, were divided into two groups (n=10) in each. Animals in the first group (G1) received drinking water magnetized at 1200 Gauss permanent magnet, while animals in the second group (G2) received drinking natural water (NW).

Feeding and drinking systems:

All experimental buffalo cows were fed a diet based on their live body weight included concentrate feed mixture (CFM), rice straw, and corn silage as recommended by the APRI, (2002). The CFM consisted of 37.5% yellow corn, 20% soybean meal, 15% maize gluten, 22.5% wheat bran, 3% molasses, 0.5% and 1.5% common salt. Chemical analysis of representative feed samples as analyzed on a DM basis for CP, CF, EE, NFE and ash according to the official A.O.A.C methods. (2000).

Chemical composition of CFM, rice straw and corn silage used in feeding buffalo cows in all groups is shown in Table (1).

Table 1. Chemical composition of feedstuffs used in feeding buffalo cows during the experimental period.

Ingredient	DM%	Composition of DM%					
		OM	CP	CF	EE	NFE	Ash
CFM	89.71	91.58	15.62	9.63	2.92	63.41	8.42
Corn silage	35.10	94.89	9.39	23.18	2.19	60.13	5.11
Rice straw	91.08	83.58	2.98	34.89	1.36	44.39	16.42

DM (dry matter); OM (organic matter); CP(crude protein); CF (crude fiber); EE (ether extract); NFE (Nitrogen free extract) and CFM (concentrate feed mixture).

Milking system

Buffalo cows were milked twice/day by hand milking at 6 a.m. and 6 p,m

Preparation of magnetically treated Water (MTW)

One permanent magnet was borrowed from (Nefertari Biomagnetic Comp., Egypt) 1200 Gauss magnet which was produced for the conditioning of pipe water A Nefertari magnet is a hollow cylinder in the shape of a water pipe. The magnet is installed in the same water pipe of the station before the drinking basin tap of the experimental animals. The water passes through a magnetic field, the animals are drunk three times a day in the morning and afternoon at 12 o'clock and at four o'clock and then leave The tub was clean for the next day

Water quality

Physiological properties for ordinary and magnetically treated water were determined according to H.M.S.O. (1981).

Milk yield and sampling:

Milk yield was recorded individually in each group biweekly during the experimental period. Milk sampling were taken individual at 6, 10 and 14 weeks of lactation period (3 sampling times) and kept in refrigerator (4°C), at the end of the experiment, all of the samples were analyzed for their composition, milk fat, protein and lactose using Milk Scan (Model 133B).

White soft cheese manufacturing:

White soft cheese was produced from milk of each group taken at 6, 10 and 14 of lactation weeks according to Fahmy and Sharara (1950) and Abo-Donia (1986). Fresh buffalo milk was heat treated to 80^0C for 10 minutes and then cooled to 40^0C, and salt (5 per cent) was added to each portion and well stirred, and calcium chloride (0.02 per cent) was added thereafter.

The rennet was added at a rate of 1.5 g/100 kg milk and left to complete coagulation. The curd was ladled with fabric in rectangular frames (20x20 cm), and the drained whey was gathered for organoleptic allying purposes.

Organoleptic properties:

Cheese samples were organoleptically tested for flavor, body & texture as well as outer appearance by 8 staff members of dairy department, Animal Production Research Institute, Agricultural Research Center, Ministry of Agriculture as described by Tamime and Robinson (1999). Flavor, body & texture and appearance were scored out of 50, 40 and 10 points, respectively.

Statistical analysis:

The obtained data in this study were statistically analyzed using SAS (2000). Data of water properties and milk yield were statistically analyzed by T- test. However general linear procedures were used in factorial design (2 water treatment x 3 lactation weeks) for statistical analysis of milk composition and organoleptic properties of cheese. The significant differences of lactation weeks were tested by Duncan's Multiple Range Test (Duncan, 1955).

RESULTS AND DISSECTION

Water quality

Properties of magnetic and nature water are presented in Table 2. Results revealed improved water quality when exposed to the magnetic field with significant ($P<0.05$) increase in pH, total dissolved solids, alkalinity and calcium, magnesium, potassium and sodium. However, conductivity, salinity, turbidity, total hardness, and chloride concentration of chloride significantly decreased in magnetic water (Tables 2).

Table 2. Properties of magnetic and natural water using in drinking buffaloes cows.

Items	Non-magnetic water	Magnetic water	Sig. P-value
pH value	7.45 ± 0.015^b	7.59 ± 0.028^a	0.014^*
T. dissolved solids (mg/l)	15.59 ± 0.21^b	16.83 ± 0.16^a	0.01^{**}
Conductivity (µs/cm)	2273.5 ± 3.69^a	2361.4 ± 6.14^b	0.000^{***}
Alkalinity (mg/l)	290.7 ± 1.20^b	307.3 ± 1.42^a	0.000^{***}
Salinity (mg/l)	116.2 ± 1.92^a	102.3 ± 0.49^b	0.01^{**}
Turbidity (ntu)	1.92 ± 0.04^a	1.36 ± 0.04^b	0.01^{**}
T. hardness (ppm)	191.6 ± 4.1^a	178.1 ± 0.9^b	0.05^*
Chloride (ppm)	458.8 ± 1.13^a	442.2 ± 4.39^b	0.05^*
Calcium (ppm)	83.80 ± 0.4^b	88.93 ± 0.38^a	0.001^{***}
Magnesium (ppm)	98.44 ± 0.47^b	108.1 ± 0.85^a	0.001^{***}
Sodium (ppm)	6.14 ± 0.02^b	6.55 ± 0.06^a	0.01^{**}
Potassium (ppm)	1.28 ± 0.03^b	1.56 ± 0.02^a	0.01^{**}

Significant at, *** P< 0.001 and ** P< 0.01 and *P < 0.01

a and b: means in the same row with different superscripts are significantly different.

Some investigators have reported that magnetic treatment affects water properties such as increasing light absorbance and pH value and decreasing in surface tension (Cho and Lee, 2005). Normal water (NW) has a pH of approximately 7 whereas magnetic water can reach a pH of 9.2 after exposure to a 7000 gauss strength magnet for a long time (Lam, 2001). Increasing pH value of MW may

be related to more hydroxyl ions created to form alkaline molecules, and then reducing acidity. Increasing dissolved O_2 could be attributed to decreasing organic matter content, whereas physics showed marked changes in weight of water under the influence of magnetic fields (Yacout *et al.*, 2015).

The increase in salinity due to magnetic exposure could be attributed to increasing the soluble salts that is in parallel with the conductivity. Ibrahim (2006) concluded that the magnetic field applied may affect the formation of water molecule hydrogen bonds, and may result in changes in conformation. These changes could be the reason for the variations observed in both conductivity and dielectric content. Water passing through the magnetic field has been reported to acquire finer and more homogeneous structure (Tkachenko and Semyonova, 1995). The enhancement of fluidity, dissolves the potential of different constituents such as minerals and vitamins (Kronenberg, 1985), and ultimately strengthens the biological function of solutions that positively influence human, animal and plant output (Al-Mufarrej *et al.*, 2005).

Milk yield:

Daily milk yield during 14 weeks for buffalo cows consumed magnetic and tap water is presented in Table 3.

Results in Table 3 show that the milk yield from buffalo cows consumed magnetic was considerably higher (P<0.01) throughout weeks from 6 to 14 week) than buffalo consumed nature water, while no significant differences between them throughout weeks from 2 and 4 week).

In the present study, the average increase in milk production (18 %) are in agreement with Kim *et al.* (2015), who reported that the average increase in production of milk after use of magnetic water was 16.5 -17.58% in dairy cows**.** Also**,** Alkudsi and Mazidawi (2012) reported that magnetic water – treated groups were superior (P<0.05) in milk yield as compared with control group, from week 6 postpartum until the end of the experiment in Holstein cows.

These findings are consistent with Al-Maro (2011), who noted a significant increase in milk production of ewes drinking magnetic water (700 and 1400 gauss) in comparison with the control. These results were also consistent with the findings of Shamsaldain and Al Rawee (2012), who suggested that Awassi sheep's milk production increased when drinking magnetic water intensity (1000 gauss) compared with tap water.

The improvement in milk output can be due to the beneficial impact of magnetic water on digestion; absorption; cellular growth and its functions; circulatory system and udder (Hussen, 2002; Lebeau, 2001).

Rodriguez *et al.* (2002) noted that the magnetic field could lead to a decrease in the melatonin hormone in lactating cows, which leads to an increase in the (IGF-1) insulin-like growth factor-1 or may lead to an increase in prolactin hormone secretion and this increase is important in milk secretion (Suttie *et al.*, 1992) cited a decrease in the melatonin hormone.

Table 3. Effect of magnetic water on milk yield of buffalo cows (mean ±SE)

Lactation week	Magnetic water	Non-magnetic water	Sig. (P-value)
W2	10.27±0.22	10.26±0.29	0.000^{NS}
W4	11.0±0.64	11.1±0.43	0.09^{NS}
W6	$12.26±0.22^{a}$	$10.91±0.52^{b}$	7.76^{**}
W8	$12.42±0.24^{a}$	$11.13±0.43^{b}$	8.07^{**}
W10	$13.11±0.22^{a}$	$11.22±0.47^{b}$	17.07^{**}
W12	$13.42±0.22^{a}$	$10.34±0.3^{b}$	68.7^{***}
W14	$13.1±0.20^{a}$	$9.1±0.15^{b}$	179.8^{***}

NS: Non significant, *** P< 0.001 and ** P< 0.01

a and b: means in the same row with different superscripts are significantly different.

Milk composition:

Data in Table 4 indicated that buffalo cow drinking magnetic water had significantly higher (P<0.05) overall means of fat, protein, lactose, total solids (TS), and solids not fat (SNF) contents than control group, while overall mean of ash content showed an opposite trend. Similarly, Kim *et al.* (2015) found that cow milk with magnetic water treatment has been reported to have a fat better than without magnetic water treatment.

Table 4. Effect of magnetic water on milk composition of buffalo cows (mean ±SE)

Item	Milk composition (%)					
	Fat	Protein	Lactose	T.S	S.N.F	Ash
Water						
Magnetic water	7.53^{a}	4.47^{a}	4.84^{a}	17.63^{a}	10.1^{a}	0.79^{b}
Non-magnetic water	7.06^{b}	4.37^{b}	4.77^{b}	17.04^{b}	9.98^{b}	0.85^{a}
±SEM	0.43	0.16	0.17	0.05	0.25	0.006
Sig.	***	***	**	***	**	***
(P-value)	61.302	20.160	10.309	69.497	10.471	49.937
Lactation week:						
Week (6)	7.26	4.51^{a}	4.75^{b}	17.38	10.12^{a}	0.85^{a}
Week (10)	7.28	4.39^{b}	4.8^{b}	17.28	10.0^{b}	0.81^{b}
Week (14)	7.35	4.35^{b}	4.86^{a}	17.36	10.01^{b}	0.795^{b}
±SEM	0.05	0.02	0.02	0.06	0.03	0.007
Sig.	NS	***	***	NS	*	***
(P-value)	0.811	19.460	7.764	0.768	4.380	15.471

T.S= Total solid S.N.F= Solid not fat

***** P< 0.001, ** P< 0.01 and *P< 0.05**

a and b: means in the same row with different superscripts are significantly different.

Also, sampling time significantly (P<0.05) affects milk composition. During the lactation period (from 2 to 14 week), overall means of protein, SNF and ash contents significantly (P<0.05) decreased, while lactose content significantly (P<0.05) increased. However, the percentages of fat and TS were not affected by sampling time (Table 4).

The effect of interaction between treatment and sampling time was significant (P<0.05) on contents of protein, lactose SNF, and ash, while fat and TS contents were not affected significantly by this interaction (Fig.1).

This changes, may be reflected that positive affected of magnetic water in milk composition.

The present results clear that increase in milk yield in treatment group. Al-Jack (2001); Sargolzehi *et al.* (2010) and Shamsaldain and Al Rawee (2012) reported that improvement in milk yield was associated with an increase in fat and protein production in animals consumed magnetic water. This may be attributed to the level of milk protein that is directly proportional to the volume of milk generated or to a change in the digestion of crude protein, where magnetic drinking water improves the passage of small intestines and enhances digestion and absorption processes (Yacout *et al.*, 2015) and Barrett (2002).

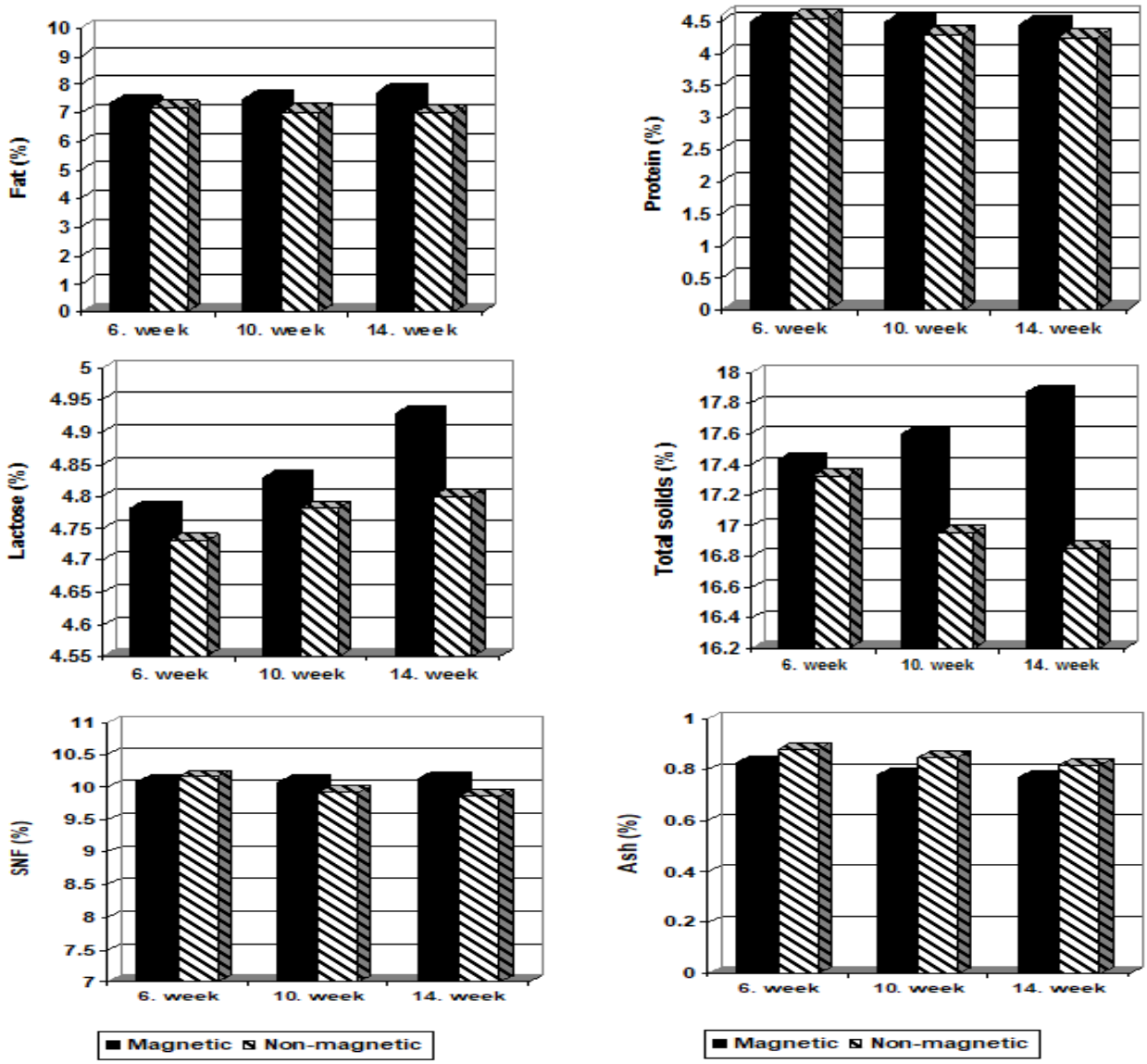


Figure 1 . Milk contents (fat, protein, lactose, total solids (TS), solids not fat (SNF) and ash) in magnetic and non-magnetic water groups at different weeks of lactation period.

Data in this study are in agreement with those reported by Yacout *et al.* (2015), who observed that Zaraibi does drinking magnetic water had significantly (P<0.05) higher milk contents included TS, SNF, fat, protein and lactose than control group, while ash content was not affected. In contrast, Alkudsi and Mazidawi (2012) in buffalo cow and Sargolzehi *et al.* (2009) in lactating Saanen goats, found non-significant effect of consuming magnetic water on milk composition.

Organoleptic properties of cheese

Sensory properties of cheese as affected by drinking magnetic water and lactation week are presented in Table 5.

Overall means of cheese sensory properties were not significantly (P<0.05) affected by type of drinking water or lactation week and their interaction (Table 5 and Fig. 2).

Total scoring points of organoleptic properties slightly increased in white cheese made from milk of buffalo drinking magnetic water (92.23) and natural water (91.17).

Table 5. Organoleptic scores of cheese made from milk as affected by drinking magnetic and non-magnetic water for drink.

Item	Components			
	Flavor (50)	Body and Texture (40)	Appearance (10)	Total (100)
Water				
Magnetic water	46.17	37.25	8.81	92.23
Nature water	46	37.08	8.63	91.17
±SEM	0.26	0.26	0.85	0.31
Sig.	NS	NS	NS	NS
(P-value)	0.200	0.207	2.334	1.420
Sample time				
Week (6)	46	36.75	8.63	91.38
Week (10)	46.25	37	8.81	92.06
Week (14)	46	37.75	8.71	92.64
±SEM	0.32	0.32	0.1	0.38
Sig.	NS	NS	NS	NS
(P-value)	0.200	2.690	0.815	2.146

T.S= Total solid S.N.F= Solid not fat
***** P< 0.001, ** P< 0.01 and *P< 0.05**
a and b: means in the same row with different superscripts are significantly different.

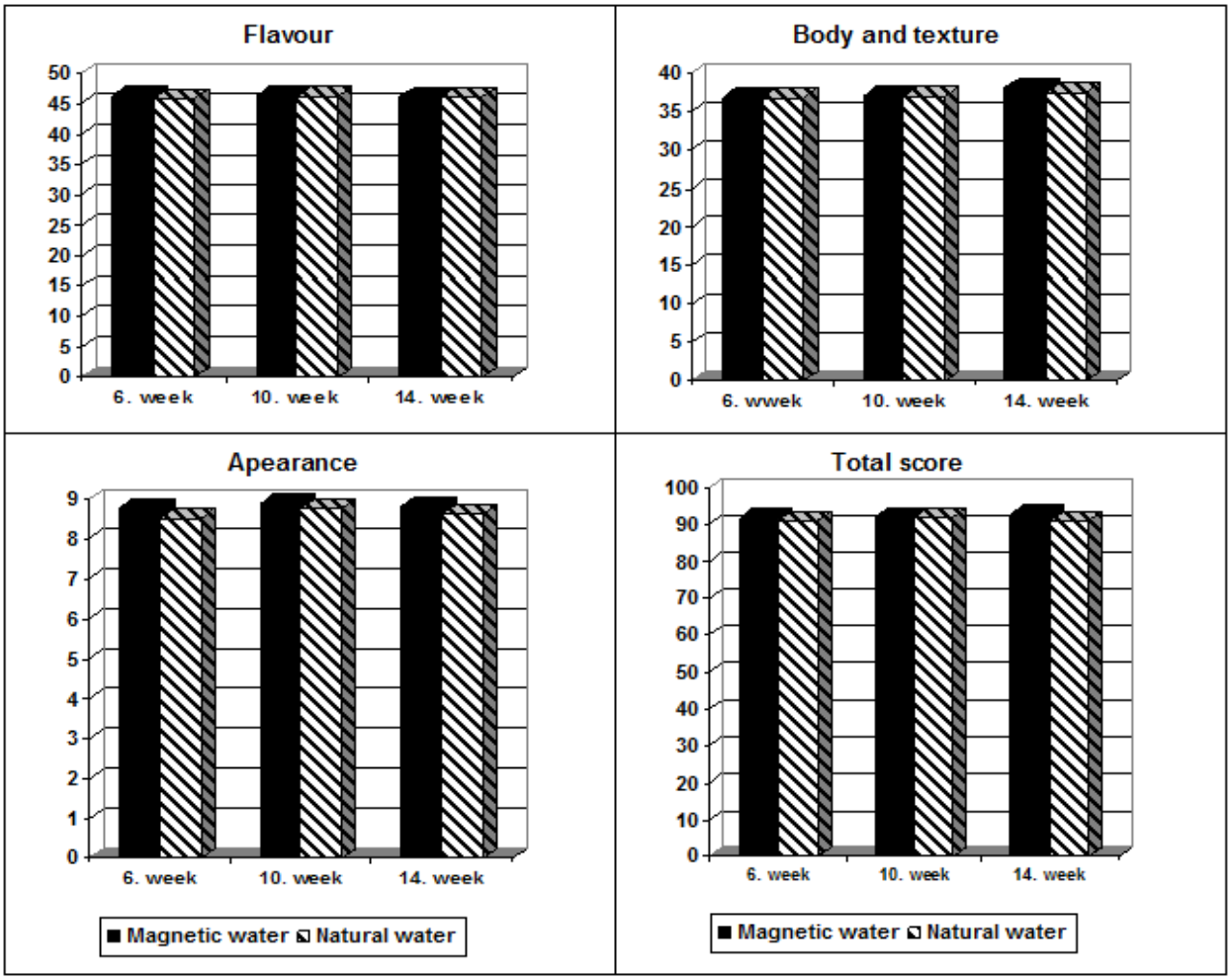


Figure 2. Effect of Interaction between treatment (magnetic and natural water) and lactation week on organoleptic scores of cheese.

Although organoleptic properties and chemical composition of labneh (Zabady) from goat milk drinking magnetic water were higher than that obtained from control group (Yacout *et al.*, 2015), the present study showed that milk type has no marked effect on flavor, body and texture and the appearance of buffalo milk cheese.

CONCLUSION

On the basis of the results obtained we conclude that: buffalo cow consuming magnetic water at 1200 Gauss improved milk yield and composition, while had no effect on organoleptic scores of cheese.

ACKNOWLEDGEMENTS

We thank Nefertari Biomagnetic comp., Egypt for supporting this study by their product as borrow during experimental period.

REFERENCES

Abou Donia, S.A. (1986). Egyptian Domiati soft white pickled cheese. New Zealand. J. Dairy Sci. and Tech., 21 (3) : 167.

Al-Jack, B.H. (2001). The effect of magnetic water on milk properties and bacterial density. Scientific research DEMO, University of Science and Technology, Sudan.

Alkudsi, N.H. and Mazidawi, H.R.H. (2012). Effect of ma.gnatic water on milk production and its components in Holestein cows. Iraqi Journal of Veterinary Sciences.V(26):449-455.

Al-Maro, M.W. (2011). The effect of the use of magnetic water in milk production and its components and the growth of the Awassi lambs. Mosul University, Iraq.

Al-Mufarrej, S., Al-Batshan, H.A., Shalaby, M.I, Shafey, T.M/ (2005). The effects of magnetically treated water on the performance and immune system of broiler chickens. Inte J Poul Sci 4(2): 96-102.

AOAC. (2000). Official Methods of Analysis 17th Ed. Association of Analytical Chemists, Arlington, Virginia, USA.

APRI. (2002). Recommendation of the Animal Production Research Institute.

Barrett, S. (2002). Consumer Health Digest. Nation Council Against Health Fraud.

Batmanghelidj, F. (2005). Diamagnetic water. Is it just water? Biomagnetizer biophysics institute. Canada.

Cho, Y.I. and Lee, S.Hyuk (2005). Reduction in the surface tension of water due to physical water treatment for fouling control in heat exchangers. International Communications in Heat and Mass Transfer 32: 1–9.

David, C. (1995). Happiness is a magnet. New Scientist, pp. 24-29.

Davis, B. (2004). Structural water is changing models large water – molecule cluster may be crucial to cellular processes. 18(21): 14-20.

Fahmy, A.H. and Sharara, H. A. (1950). Study on Egyptian Domiati cheese J.Dairy Res. , 17:312.

Gholizadeh, M., Arabshahi H, Saeidi M.R, and Mahdavi, B. "The effect of magnetic water on growth and quality improvement of poultry", Middle-East Journal of Scientific Research, 3: 140-144, 2009.

H.M.S.O. (1981). Total hardness, calcium hardness and magnesium hardness in raw and potable water by EDTA titrimetry. Methods for the extraction of water and associated materials, tentative method HMSO London.

Hussen, M.A. (2002). Magnetic water treatment is an attractive option. (http://www.1st-in-wellness.com).

Ibrahim, H. (2006). Biophysical properties of magnetic distilled water. Egypt J Sol 29(2): 1-7.

Ikezoe, N.; Hirota, J.; Nakagawa, S. and Kitazawa, K. (1998).making water levitate. Natural, 393: 749-750.

Kronenberg, K.J .(1985). Experimental evidence for effects of magnetic fields on moving water. IEEE Transaction on Magnetics 21(5): 2059- 2061.

Lam, M. (2001). Magnetic water. www.DrLam.com.

Lebeau, J. (2001). Diamagnetic therapy. Preview on how to use magnets. Part I. Advanced holistic alternative cancer library answers, research and treatment. (www.cancer.com).

Lin, I.J and Yotvat, J.(1990). " Exposure of irrigation and drinking water to magnatic field with controlled power and direction" Journal of Magntism and Magnetic Materials, 83: 525-526.

MTC., (2006). The effect of magnetic field on the taste of water. Magnetic Therapy Council. (www.Magnetic therapyfacts.org).

Ovchinnikova, K. and Pollack, G.H. (2009).Can water store charge? Langmuir, 25: 542-547.

Rashid, K.A., Al-Hillali, A.H.K., Neda, S.M., and Irhaim, K.I. (2009). "Effect of Magnetically Treat Water on Immunological Response in Fawbro Broiler", Iraqi Journal of Veterinary Science 4: 17-23.

Reuter, R. (2004). Water is the most important nutrient. Nobel Foundation Agricultural Division. http://www.noble.org/Ag/livestock/waterimportant

Rodriguez, M., Petitclerc, D. Nguyen, D.H. Block, E. Burchard, J.F. (2002). Effect of Electric and Magnetic Fields (60 Hz) on Production, and Levels of Growth Hormone and Insulin-Like Growth Factor 1, in Lactating, pregnant cows Subjected to short Days. J Dairy Sci 85(11): 2843-2849.

Sargolzehi, M.M. Rokn-Abadi, M.R. Naserian, A.A. (2010). The effects of magnetic water on milk and blood components of lactating Saanen goats. Inte J Chem 1(1): 57-62.

Shamsaldain, Q.Z, Al Rawee, E.A. (2012). Effect of magnetic water on productive efficiency of Awassi sheep. Iraqi J Vete Sci 26(2): 129- 135.

Suttie, J.M, Breier, B.H, Gluckman, P.D, Littlejohn, R.P, Webster, J.R. (1992). Effect of MLT implants on insulin-like growth factor-1 in male red deer (Cervus elaphus). Gen Comp Endo 87: 111-119.

Szkatula, A., Balanda, M., Kopic, M. (2002). Magnetic of industrial water silica activation. European physical. J. Appl. Phy. 18: 41-49.

Tamime, A. Y.and R. K. Robinson. (1999). Yoghurt: Science and Technology(2thed.).Cambridge, UK: Woodheat publishing Ltd.

Tkachenko, Y., Semyonova, N. (1995). Your way to health, Magnetic water plus separate nutrition. In: Yuri P Tkachenko (Ed.), Mysteries of Magnetic Energies A Collection of Scientific Works on the Usage of Magnetic Energies in Medical Practice. Printing Emirates, Printing & Publishing-Sharjah, UAE, 6: 225-244.

تأثير إستعمال الماء الممغنط على إنتاج اللبن ومكوناته في إناث الجاموس.

مسعود محمد غنيم ، شريف مغاورى شامية ، حسين مصطفى الرجلاتى ، محمد محمود حجازى و رمضان مصطفى حسبو

معهد بحوث الإنتاج الحيواني، مركز البحوث الزراعية

الهدف من هذه الدراسة هو تقييم تأثير الماء الممغنط على إنتاج اللبن ومكوناته في الجاموس الحلاب في هذه الدراسة أستخدمت عشرون جاموسه من الموسم الرابع الى الخامس أوزانهم من 450كجم إلى 520كجم وزن حي ،قسمت الحيونات في التجربة إلى تحت مجموعتين 10 / مجموعة. كانت حيوانات المجموعة الأولى (G1) تشرب المياه الممغنطة ذات المغناطيس الدائم قوته 1200 جاوس ، بينما كانت حيوانات المجموعة الثانية (G2) تشرب المياه العادية . تم تسجيل إنتاج الحليب الفردي لكل حيوان في كل مجموعة مرتين أسبوعياً وكذلك تحليل مكونات اللبن وتصنيع الجبن الأبيض الطري (مرة / شهر) خلال فترة التجربة. أوضحت النتائج أن المياه المعرضة للمجال المغناطيسي أظهرت تحسن في جودة المياه الممغنطه. كان إنتاج اللبن من الجاموس المعامل بالماء الممغنط أعلى معنوياً ($P < 0.01$) خلال (الأسبوع 6 إلى 14) مقارنة بالجاموس المعامل بالمياه العادية، بينما لا توجد فروق معنوية بينهما طوال الأسبوعين (2 و 4). كان لأسبوع أنتاج اللبن تأثير أعلى بشكل ملحوظ ($p < 0.05$) في مكونات اللبن ، حيث كان البروتين و المواد الصلبة غير الدهنية ونسبة الرماد (٪) أقل بشكل ملحوظ عند ($P < 0.05$) كانت منخفضة في العينة المأخوذه فى الأسبوع ال10 و 14 مقارنةً بالأسبوع السادس ، ونسبة اللاكتوز كانت عكس هذا الإتجاه. كان للتفاعل بين المعاملة ووقت العينة تأثير معنوي عالى ($p < 0.05$) في نسبة البروتين والمواد الصلبة الغير دهنية واللاكتوز والرماد، والدهن والمواد الصلبة الكلية أيا كان لم يتأثرالتفاعل بينهم سواء مع ماء الشرب أو زمن العينات وتفاعلها معنويا. الخواص الحسية للجبن لم تتاثر معنويا بواسطة مياه الشرب ووقت العينه والتفاعل بينهم. الإستنتاج ، على أساس النتائج التي تم الحصول عليها نستنتج أن: الجاموس المستهلك للماء الممغنط عند قوة 1200 جاوس حدث تحسين لإنتاج اللبن ومكوناته، بينما درجات الجبن الحسية لم تتأثر.