Effect of Additive Som Plant oils on the Chemical, Microbiological and Organoleptic Quality of White Soft Cheese

Nehad R. EL-Tahan;Wahed A. Ragab and Zahraa S.Shenishen

Nutrition and Food Science Dep., Faculty of Home Economics, Menofia University, Egypt

ABSTRACT

Soft white cheese is a widely popular acidified dairy product. It has a limited shelf life, strict hygiene and safety of the product. The objective of this study was to improve the quality of soft white cheese and prolonged the shelf life. *Moringa oleifera* oil was added to soft white cheese at concentrations 75 and 90 ppm. Subsequently, the chemical composition , microbiological quality and organoleptic properties of soft white cheese for storage period 45 day at 5±2°C was studied. The results indicated that addition of *Moringa oleifera* oil at all levels has remark able effect on fat, total protein ,salt, total nitrogen contents, moisture, PH value and acidity. The acidity content and PH value increased with increasing the level of *Moringa oleifera* oil at level 90 ppm while it decreased with increasing *Moringa oleifera* oil at level 75 ppm . Acidity increased gradually in all treatments during storage period. The moisture content increased with increasing the level of *Moringa oleifera* oil at level 75 ppm while it decreased with increasing *Moringa oleifera* oil at level 90 ppm. Total protein and total nitrogen contents increased with increasing the level of *Moringa oleifera* oil at level 90 ppm while it decreased with increasing *Moringa oleifera* oil at level 75 ppm. No significant differences (P>0.05%) is found between fat and salt contents In soft white cheese storage period for 45 day at 5±2°C. Also, the results indicated that TCB, yeast, moulds, psychrophilli bacteria and E.coli decreased with increasing *Moringa oleifera* oil at level 90 ppm. Flavor, texture and appearance color showed that the results were recorded the higher score at the level 90 ppm more than level 75 ppm throughout storage period at 5±2°C. So, It could be concluded that, using (MOO) at level 90 ppm as soft white cheese preservative led to improve microbial stability and improve shelf life of soft white cheese.

Keywords: *Moringa oleifera oil - soft cheese - total count bacteria- sensory evaluation.*

INTRODUCTION

Soft cheese is one of the most appreciated cheeses in Middle Eastern countries. The cheese is a pickled cheese (salt 2–15%), although it may be sold fresh. This type of cheese is produced either by enzymatic or acidic coagulation of fresh milk (buffaloes or cows milk) or reconstituted skim milk powder with oils **(Abou-Donia, 1986).** It also has been made with or without the addition of starter cultures to cheese milk. Starter cultures govern the flavor and texture of the cheese, and help to suppress the spices are being sought for their medicinal value as antioxidants and as antimicrobials **(Frankel *et al.,* 1996; El-Ghorab*et al.,* 2010).**

Moringa (*Moringa oleifera Lam*) is a type of local medicinal Indian herb which has turn out to be familiar in the tropical and subtropical countries. The other terms used for Moringa are Horseradish tree, Mulangay, Mlonge, Benzolive, Drumstick tree, Sajna, Kelor, Saijihan and Marango. *Moringa oleifera* LV VKRZQLQ VFLHQWLÀF division to become from Kingdom: Plantae, Division: Magnoliphyta, Class: Magnoliopsida, Order: Brassicales, Family: Moringaceae, Genus: Moringa, Species*: M. oleifera* **(Fahey, 2005).** Moringa has been used in the traditional medicine passed down for centuries in many cultures around the word, for skin infections, anemia, anxiety, asthma, blackheads, blood impurities, bronchitis, catarrh, chest congestion, cholera, conjunctivitis, cough, diarrhea, eye and ear infections, fever, glandular, swelling, headaches, abnormal blood pressure, hysteria, pain in joints, pimples, psoriasis, respiratory disorders, scurvy, semen deficiency, sore throat, sprain, tuberculosis, for intestinal worms, lactation ,diabetes and pregnancy The present review is intended to create public awareness regarding benefit of an edible plant Moringa which is also known as miracle tree (**Fahey *et al.*, 2004).** The healing properties of Moringa oil, have been documented by ancient cultures. Moringa oil has tremendous cosmetic value and is used in body and hair care as a moisturizer and skin conditioner. Moringa oil has been used in skin preparations and ointments since Egyptian times**.** Moringa provides a rich and rare combination of nutrients, amino acids, antioxidants, antiaging and anti-inflammatory properties used for nutrition and healing. Moringa has been in use since centuries for nutritional as well medicinal purposes (**Anwar and Bhanger, 2003).** These include vitamin C, which fights a host of illnesses including colds and flu; vitamin A, which acts as a shield against eye disease, skin disease, heart ailments, diarrhea, and many other diseases; Calcium, which builds strong bones and teeth and helps prevent osteoporosis; Potassium, which is essential for the functioning of the brain and nerves, and Proteins, the basic building blocks of all

our body cells. Another important point is that Moringa leaves contain all of the essential amino acids, which are the building blocks of proteins. It is very rare for a vegetable to contain all of these amino acids. And Moringa contains these amino acids in a good proportion, so that they are very useful to our bodies. These leaves could be a great boon to people who do not get protein from meat. Moringa even contains argenine and histidine two amino acids especially important for infants. Argenine and histidine, are especially important for infants who are unable to make enough protein for their growth requirements. Experts tell us that 30% of children in subSaharan Africa are protein deficient. Moringa could be an extremely valuable food source. Given its nutritional value, it can be utilized in fortifying sauces, juices, spices, milk, bread, and most importantly, instant noodles. Many commercial products like Zija soft drink, tea, and neutroceuticals are available all over the globe **(Fahey, 2005 and Huang *et al.*, 2012).**

MATERIALS AND METHODS

Materials

Fresh buffaloes milk was obtained from Milk Dep. in Secondary school of agriculture at Shebin El-kom Menofia University. Standard microbial rennet powder (Maxiren 1800MG) and moringa oil from Gomhoria, Tanta, Al-Gharbiyah Governor.

Methods

Manufacturing procedure

White soft cheese was mad in the Milk Dep. in Secondary school of Agriculture at Shebin EL-kom Menofia Governor using fresh Whole buffaloes milk according to the method described by **Fahmi and Sharara (1950)**. The cheese was manufactured using 5Kg heated (75^{o}C for 15sec and cooled to 43^{o}C) buffalos milk as control sample and 10kg heated buffaloes milk which was divided into two treatment which supplemented with moringa oil at the levels 75 and 90 ppm which was used based on the preference of the panelists (As established in preliminary studies).

Calcium chlored,edible salt and rennet were added at the rate of 0.02, 4.0 and 0.003% respectively.

Chemical analysis of white soft cheese samples:

Determination of moisture content :

The moisture content of cheese was determined according to the **(A.O.A.C., 2002)** using about 3.0g of soft cheese and the total solids percent was calculated by substracting percentage of moisture from one

hundred.

Determination of titratable acidity:

The acidity of white soft cheese samples were determined according to **ling (1963).** Distilled water at 40°C was added to 10g of the cheese samples until the total volume is 105ml the contents were shaken vigorously, then filtered, 25ml protions (equal to 2.5g of cheese) of the filtrates were titrated with N/9 NaoH,using phenolphthalein as an indicator (1% solution)the titratable acidity calculated and expressed as lactic acid percentage.

Determination of pH value:

Hydrogen ion concentration (pH) was measured by pH meter Consort **830**. The samples were prepared the same as previously in dicated under titratable acidity.

Determination of salt content :

The salt percentage of cheese was determined according to the method suggested by **A.O.A.C. (2009).**

Determination of fat content :

Fat content of the cheese determined by modified Gerber method described in **ling (1963).**

Determination of total nitrogen:

The total nitrogen was estimated by semi-micro kjeldahl method according to **ling (1963)** except that NH3 in the steam distillate were received in 25 ml boric acid solution 4% **(Rowland 1938).** The ammonia was then titrated with N/50 sulphuric acid solution **(A.O.A.C., 2007)** using 5 -6 drops of mixed in dicator (10 ml of 0.1% bromocresol green was mixed with 2 ml of 0.1% methyl red in 95% alcohol).

Determination of total proten :

Total proten was determined by semi-micro kjeldahl method according to **ling (1963).**

Microbiological analysis:

Total bacterial count, yeast and mould count, psychrophilic count and coliform groups were determined according to the method described by **APHA (2004)** international doing federation **IDF (1990) and IDF (1991).**

Organoleptic properties evaluation:

Samples of white soft cheese were organoleptically evaluated according to the scheme described by **IDF (1995).** The evaluations

were carried out by regular scoring panel (10 panelists) of staff members at Food Science Department, Faculty of Home Economics Menofia University.

Statistical analysis:

Statistical analysis was carried out using **ANOVA** variance analysis through general linear model procedure of **SPSS** programme version 17. Least significant differences were used to separate means at $p \leq 0.05$.

RESULTS AND DISCUSSION:

1. Effect of different levels of moringa oil on the chemical composition of soft white cheese storage for 45 days at 5ºC

Moisture content:

Data present in Table (1) showed that the changes in the moisture content of soft white cheese samples was significantly different($P \leq 0.05$). The highest content in control sample which was (69.05±2.03). Adding different levels from moringa oil led to decreased the moisture content through 30 days of storage but after that it could be noticed the moisture content increased. The sample with level 75 ppm of moringa oil had higher content of moisture than 90ppm while, both of them were lower than the control sample during storage period. These results are in agreements with those of **Galal, *et al.* (2003) and Rupasinghe *et al.* (2008)** who reported that the moisture content of soft white cheese during storage period for 45 days at 5±2^{o}C and supplemented with some plant oils increased ($P \leq 0.05$) during the first 15 day while it decreased gradually up to the end of storage period 45 day.

2. The titratable acidity:

Present results statistical analysis in Table (2) noticed that changes in the titratable acidity of soft white cheese significantly increased ($P \leq 0.05$) during storage period for 45 day at 5±2^{o}C. In case of treatments, it could be observed that the highest increased was moringa oil sample at the level 90 ppm then moringa oil sample at the level 75 ppm. These results are matched with **Mehanna and Hefnawy (1991) & Ahmed and Abdel–Razig (1998)** who found that the cheese acidity increased progressively gradually during storage period.

3- The salt content:

Data present in Table (3) described that non significantly differences ($P > 0.05\%$) for the percentage of salt in all treatments during storage period at 5±2^{o}c for45 day**.** These results are in agreements with those obtained by **(EOS , 2002).**

4- The total nitrogen:

Present results statistical analysis in table (4) revealed to the changes in the total nitrogen content of control and treatment soft white cheese samples during storage period at 5±2°c for 45 day. It could be observed that there is no significant differences between the sample treatment with 75 ppm moringa and the control sample during the storage period (30 days) while, at the level 90 ppm of plant oil, the total nitrogen was significantly higher than the control and the other treatment. After 30 days, there is no significant changes between the total nitrogn in both treatment and control sample. Also, it could be noticed that this parameter was decreased with increased the storage period. These results are in agreements with those of **Kandeel *et al.*, (1991) & Ahmed and Abdel–Razig (1998)** who showed that by increasing the storage period of soft white cheese at 5±2°C led to changed in total nitrogen content until 30 day from storage period while non-significantlydifferent during storage period at 45 day.

5- The protein content:

Data in Table (5) showed that changes in the protein content of control and treatment samples soft white cheese during storage period at 5±2°C for 45 day. It could be found that there was decreasing in protein content throughout storage period .Adding moringa oil at the level 90 ppm led to increase the protein content more than the control and the other treatment (75ppm) during all the storage period. The study which carried by **EL Owni and Hamid (2008)** found that the protein content of soft white cheese decreased gradually throughout storage period and this result matched with the obtained results.

6- The PH value:

Present results statistical analysis in Table (6) noticed that changes in the PH value of soft white cheese during storage period at 5±2°C for 45 day decreased significantly ($P \leq 0.05$) in the PH value throughout storage period. In case of fresh treatments, it could be observed the highest increase was control sample (6.48± 1.37) while the lowest increase were moringa oil sample at the level 90 ppm and then moringa oil sample at the level 75 ppm as (4.92±0.81) and (4.87±0.74) respectively.

During all storage period, it could be noticed that the Ph value decreased in all cheese treatments and the control sample stilled more than the treatment samples (**Abou- Dawood ,1996; Hussein 2004 and Abd-Alla *et al*., 2000)**

7- The Fat content:

Data presented in Table (7) described that there is no significant differences ($P \leq 0.05$) between the control samples and the treatment samples. There is no high changes during storage period untill 30 days but after that, the fat content in all soft white cheese samples was higher than before 30 days storage period at the same tempreature ($5 \pm 2^{o}C$). **Salama (2004)** showed that fat content in soft cheese was stable through 30 days .

8 - The microbial evaluation of soft white cheese:

Data present in Tables (8,9, 10 and 11) showed that total bacterial count, yeast and mould count, psychrophilic count and coliform groups didn't detected in all treatments with moringa levels and control samples at zero time. At storage period (15 and 30 days) the above organisms were detected but in control sample was more than the treatment samples. The level 90 ppm of moringa led to inhabit the microbes growth more than the level 75 ppm of the oil and the control sample which detected high content of microbes after 15 days. **Abd-El Kader *et al.* (2001)** showed that the antimicrobial effect of moringa oil in cheese samples especially pathogenic microbes.

9- The Sensory Evaluation of Soft white Cheese:

Data presented in Tables (12, 13 and 14) showed that adding essential oil (moring oil at level 90 ppm) play an important role in flavour development and improved the organoleptic properties in soft white cheese more than the level 75 ppm and the control sample at the storage period 30 days. While at zero times and after 15 days, the sensory properties of control sample recorded high score more than the other samples.

REFERANCES

A.O.A.C. (2002): Official methods of analysis, 17th ed. Association of Official Analytical Chemists, International Inc, Arlington, Virginia, USA.

A.O.AC. (2007): Official Method of Analysis. 18th Edn. Association of Official Analytical Chemist, Gaithersburg, MD., USA.

A.O.A.C. (2009): Official Methods of Analysis of the Association of Official Analytical Chemists, Benjamin Franklin Station,Washington, D.C.

Abd-El-Kader, Y. I.; Mehana, M. Y. and Ammar, M. A. E. (2001): Study on the effect of adding some spices to Ras cheese curd on the chemical, microbiological and organoleptical properties of the resultant cheese. Proc. the 8th Egyptian Conf. Dairy Sci.&Tech., 317.

Abou-Dawood, S. A. I. (1996): Use of some spices as natural preservatives for some dairy products. M.Sc.Thesis, Fac. Of Agric, Cairo Univ. Egypt.

Abd-Alla, M. S. ; Atalla, K. M. ;Ghazi, I. M. and Galal, E. A. (2000): Effect of some aqueous plant extracts on microbiological, chemical and organoleptic properties of ultrafiltered cheese. Annals Agric. Sci.; Ain Shams Univ., Cairo, 45: 409-420.

Ahmed, T. K. and Abd El-Razig, K. A. (1998): Manufacture of GibnaBeida (white soft cheese) from cows' and goats' milk. Egyptian J. Dairy Sci. 26: 167- 174.

Anwar, F. and Bhanger, M. I. (2003): Analytical characterization of *Moringa oleifera* seed oil grown in temperate regions of Pakistan. Journal of Agricultural and Food Chemistry 51: 6558-6563.

APHA (2004): Standards Methods for the examination of dairy products. 17th edition, H. Michael Wehr and Joseph F. Frank, editors. American Public Health Association, Washington, DC 20001, USA.

Abou-Donia, S. A. (1986): Egyptian Domiati soft white pickled cheese. Journal of Dairy Science and Technology 21, 167–195.

El-Ghorab, A. H. ;Nauman, M. ; Anjum, F. M. ;Hussin, S. and Nadeem, M. (2010): Acomparative study on chemical composition and antioxidant activity of gin ger (Zingiberofficinale) and cumin (Cuminumcyminum).Journal of Agricultural and Food Chemistry, 58, 8231–8237.

EL Owni , O. A. O. and Hamid, O. I. A. (2008): Effect of Storage period on Weight loss, chemical composition, Microbiological and sensory characteristics of Sudanese white cheese. Pakistan Journal of Nutrition 7(1): 75 80.

Egyptian Standards Organization (2002): Standard specification of soft cheese. ES No 1007.

Fahey, J.W. ; Dinkova-Kostova, A.T. and Talalay , P. (2004): The "Prochaska" microtiter plate bioassay for inducers of NQO1. Chapter 14 in Methods in Enzymology, Vol. 382, Part B, pp. 243-258 {Eds.} H. Sies & L. Packer, Elsevier Science, San Diego, CA.

Fahey, J.W. (2005): *Moringa oleifera*: A review of the medicinal evidence for its nutritional, therapeutic, and prophylactic properties. Part 1. Trees Life J, 1, 5.

Frankel, E. ; Huang, S. and Prior, E. (1996): Evaluation of antioxidant activity of rosemary extracts, carnosol, and carnisic acid in bulkvegetable oils, and fish oil and their emulsions. Journal of the Science and Food Agriculture 72, 201–208.

Fahmi, A. H. and Sharara, H. A. (1950): Studies on Egyptian Domiati cheese. J. Dairy Res., 17: 312- 328.

Galal, E. A.; Mahmoud, A. A.; El-Fakhrany, A. M. and Moawad, A. A. (2003): Effect of adding carrot puree on organoleptic chemical and

microbiological quality of UF soft cheese. Pro. The 1st International Conf. NRC, 18-20 October, Cairo, Egypt .

Huang ,G. J. ; Deng, J. S. and Huang ,S.S. (2012): Protective effect of antrosterol from Antrodia camphorata submerged whole broth against carbon tetrachloride-induced acute liver injury in mice. Food Chem, 132, 709-16. Kasolo JN, Bimenya GS, Ojok L, et al (2010). Phytochemicals and uses of Moringa oleifera leaves in Ugandan rural communities. J Med Plants Res, 4, 753-7.

Hussien, G. A. M. (2004): Manufacture of flavouredTallaga cheese.

Proc. The 9th Egyptian conf. Dairy Sci. & Tech. Egyptian J.

Dairy Sci., 32: 277.

International Dairy Federation (IDF) (1990): Milk and milk products. Enumeration of yeasts and moulds. Colony count technique at 25ºC, IDF: 94B.

International Dairy Federation (IDF) (1991): Milk and milk products. Enumeration of microorganisms. Colony count technique at 30ºC, IDF: 100B.

IDF, (1995): Sensory evaluation of dairy products reference methods, IDF: 99B.

Kandeel, A. A.; Naser, M. M. and Metwally, M. M. K. (1991): Effect of different types of rennet on the manufacture of the Domiati cheese made from goat's milk. Egyptian J. dairy Sci., 19 : 109- 116.

Ling, E. R. (1963): Dairy chemistry, vol. 2,London Chapman and Hall Ltd.(C. F. Ref. No.30).

Mehanna, N. M. and Hefnaway, S. A. (1991): Feasibility studies on manufacturing pickled soft cheese from goat's milk.Egyptian J. Agric. Res. 69 : 965- 975.

Rupasinghe,V. ; Wang, H. P.; Huber, L. G. M. and Pitts, N. L.

(2008): Effect of baking on dietary fibre and phenolics of muffins

incorporated with apple skin powder. Food Chemistry, 107:1217-1224.

Salama, F. M. M. (2004): Improving the quality of Domiati cheese. Proc. The 9th Egyptian Conf. for Dairy Sci. &Tech. Egyptian J.Dairy Sci., 385-397.

Table (1): Effect of storage period on the moisture content

Treatment	Fresh	15 day	30 day	45 day
Control	69.05^{a}± 2.03	69.32^{b}± 3.21	68.13^{a}± 3.01	65.39^{a}± 1.28
Cumin 75 ppm	66.53^{b}± 2.42	68.79^{b}± 2.68	67.80^{a}± 2.07	64.26^{a}± 1.15
Cumin 90 ppm	62.79^{c}± 2.68	70.94^{b}± 2.87	65.33^{b}± 3.03	62.22^{b}± 1.11
Moringa75 ppm	67.34^{b}± 3.03	72.8^{a} ± 2.07	66.59^{b}± 1.48	58.94^{c}± 0.83
Moringa 90 ppm	65.63^{b}± 3.52	70.83^{b} ± 3.72	63.34^{c}± 1.22	62.83^{b}± 2.72

Table (2): Effect of storage period on the titratable acidity

Treatment	Fresh	15 day	30 day	45 day
Control	0.24^{b}±0.02	0.30^{c}± 0.14	0.42^{c} ± 0.32	0.52^{c} ± 0.11
Cumin75 ppm	0.28^{b}± 0.03	0.31^{c} ± 0.13	0.48^{b}± 0.21	0.56^{c} ± 0.46
Cumin 90 ppm	0.35^{a} ± 0.05	0.37^{b}± 0.12	0.53^{b} ± 0.04	0.63^{b} ± 0.51
Moring 75 ppm	0.36^{a} ± 0.03	0.42^{a} ± 0.11	0.60^{a} ± 0.05	0.69^{b} ± 0.16
Moring90 ppm	0.37^{a} ± 0.12	0.45^{a} ± 0.12	0.65^{a} ± 0.12	0.76^{a} ± 0.01

Table (3): Effect of storage period on the Nacl:

Treatment	Fresh	15 day	30 day	45 day
Control	4.65^{a} ± 1.54	5.39^{a} ± 0.28	5.42^{a} ± 0.31	5.82^{a} ± 0.71
Cumin 75 ppm	4.22^{a} ± 0.11	5.14^{a} ± 0.18	5.21^{a} ± 0.10	5.48^{a} ± 1.37
Cumin 90 ppm	4.39^{a} ± 0.27	5.13^{a} ± 1.10	5.56^{a} ± 1.45	5.89^{a} ± 1.76
Moring 75 ppm	4.78^{a} ± 0.67	5.09^{a} ± 0.07	5.42^{a} ± 1.31	5.83^{a} ± 0.71
Moring 90 ppm	4.09^{a} ± 1.18	5.11^{a} ± 1.01	5.56^{a} ± 1.45	5.87^{a} ± 0.75

Table (4): Effect of storage period on the total Nitrogen:

Treatment	Fresh	15 day	30 day	45 day
Control	2.38 [b] ± 0.51	2.34 [b] ± 0.72	2.26 [b] ± 0.22	2.14 [a] ± 0.26
Cumin 75 ppm	2.77 [a] ± 0.61	2.30 [b] ± 0.03	2.19 [b] ± 0.12	2.15 [a] ± 0.25
Cumin 90 ppm	2.90 [a] ± 0.01	2.52 [b] ± 0.56	2.17 [b] ± 0.18	2.14 [a] ± 0.13
Moring 75 ppm	2.44 [b] ± 0.01	2.24 [b] ± 0.55	2.20 [b] ± 0.24	2.18 [a] ± 0.17
Moring 90 ppm	2.96 [a] ± 0.55	2.95 [a] ± 0.17	2.60 [a] ± 0.63	2.22 [a] ± 0.27

Table (5): Effect of storage period on the protein content:

Treatment	Fresh	15 day	30 day	45 day
Control	15.18 [b] ± 0.11	14.93 [b] ± 1.82	14.42 [b] ± 1.31	13.65 [b] ± 1.54
Cumin 75 ppm	17.67 [a] ± 1.56	14.67 [b] ± 1.56	13.97 [b] ± 1.86	13.72 [b] ± 1.61
Cumin 90 ppm	18.50 [a] ± 1.84	16.08 [b] ± 1.06	13.84 [b] ± 1.73	13.65 [b] ± 1.54
Moring 75 ppm	15.57 [b] ± 1.46	14.29 [b] ± 0.18	14.04 [b] ± 1.03	13.98 [a] ± 1.80
Moring 90 ppm	18.88 [a] ± 1.77	18.82 [a] ± 0.71	16.59 [a] ± 1. 48	14.16 [a] ± 1.05

Table (6): Effect of storage period on the PH value:

Treatment	Fresh	15 day	30 day	45 day
Control	6.48 [a] ± 1.37	5.30 [a] ± 0.26	4.84 [a] ± 1.63	4.48 [a] ± 1.32
Cumin 75 ppm	4.96 [b] ± 1.85	4.50 [b] ± 0.32	4.71 [a] ± 1.50	4.55 [a] ± 0.44
Cumin 90 ppm	5.58 [b] ± 0.47	4.40 [b] ± 0.38	4.38 [a] ± 0.26	4.18 [a] ± 0.12
Moring 75 ppm	4.87 [b] ± 0.74	4.30 [b] ± 0.28	4.26 [a] ± 0.15	4.20 [a] ± 0.17
Moring 90 ppm	4.92 [b] ± 0.81	4.60 [b] ± 1.70	4.56 [a] ± 0.45	4.30 [a] ± 0.22

Table (7): Effect of storage period on the Fat content

Treatment	Fresh	15 day	30 day	45 day
Control	18.15 ^{a} ± 1.13	18.50 ^{a} ± 1.42	18.50 ^{a} ± 1.42	19.60 ^{a} ± 1.56
Cumin 75 ppm	18.20 ^{a} ± 1.22	18.30 ^{a} ± 1.28	18.50 ^{a} ± 2.50	19.20 ^{b} ± 1.12
Cumin 90 ppm	18.18 ^{a} ± 0.17	18.40 ^{a} ± 1.32	18.60 ^{a} ± 1.60	19.40 ^{b} ± 1.32
Moring 75 ppm	18.14 ^{a} ± 1.13	18.33 ^{a} ± 1.23	18.65 ^{a} ± 1.63	19.80 ^{a} ± 1.76
Moring 90 ppm	18.12 ^{a} ± 1.11	18.28 ^{a} ± 1.27	18.70 ^{a} ± 1.62	19.87 ^{a} ± 1.11

Table(8): Effect of storage period on the total count bacteria of soft white cheese during cold storage at 4ºC.

Samples	Storage period			
	0	15	30	45
Control	0×10	5×10^{-5}	7×10^{-7}	5×10^{-8}
Sample A	0×10	7×10^{-3}	1×10^{-5}	5×10^{-7}
Sample B	0×10	6×10^{-3}	2×10^{-6}	4×10^{-6}
Sample C	0×10	2×10^{-2}	2×10^{-3}	5×10^{-4}
Sample D	0×10	0×10	2×10^{-2}	5×10^{-4}

Table(9):Effect of storage period on Psychrophillic bacterial count of soft white cheese during cold storage at 4ºC.

Samples	Storage period			
	0	15	30	45
Control	0 × 10	3 × 10	4×10^{-4}	5×10^{-8}
Sample A	0 × 10	2 × 10	1×10^{-2}	2×10^{-4}
Sample B	0 × 10	6 × 10	2×10^{-2}	3×10^{-4}
Sample C	0 × 10	1 × 10	2×10^{-2}	5×10^{-3}
Sample D	0 × 10	0 × 10	5 × 10	3×10^{-2}

Table (10): Effect of storage period on acount yeasts and moulds of soft white cheese during cold storage at 4ºC.

Samples	Storage period			
	0	15	30	45
Control	0×10	3×10	4×10^{-4}	5×10^{-8}
Sample A	0×10	2×10	1×10^{-2}	2×10^{-4}
Sample B	0×10	6×10	2×10^{-2}	3×10^{-4}
Sample C	0×10	1×10	2×10^{-2}	5×10^{-3}
Sample D	0×10	0×10	5×10	3×10^{-2}

Table (11): Effect of storage period on acount E.coli of soft white cheese during cold storage at 4ºC.

Samples	Storage period			
	0	15	30	45
Control	$o \times 10$	2×10^{5}	1×10^{-6}	4×18^{-8}
Sample A	0×10	0×10	0×10	1×10^{-4}
Sample B	0×10	0×10	0×10	2×10^{-4}
Sample C	0×10	0×10	0×10	3×10^{-3}
Sample D	0×10	0×10	0×10	3×10^{-2}

Table (12) Effect of storage period on the flavor of soft white Cheese:

Treatment	Flavor (50) Storage period		
	Fresh	15	30
Control	$47^{a} \pm 1.32$	$44^{a} \pm 1.21$	$19^{c} \pm 2.11$
Cumin oil 75ppm	$47^{a} \pm 1.17$	$40^{c} \pm 1.22$	$24^{b} \pm 1.44$
Moringa oil 75ppm	$47^{a} \pm 2.32$	$41^{b} \pm 1.22$	$19^{c} \pm 0.76$
Cumin oil 90ppm	$46^{a} \pm 1.53$	$41^{b} \pm 1.22$	$17^{c} \pm 0.54$
Moringa oil 90ppm	$46^{a} \pm 2.42$	$42^{b} \pm 1.72$	$33^{a} \pm 1.56$

Table (13) Effect of storage period on the body & texture of soft white Cheese:

Treatment	Body & Texture (35) storage period		
Control	fresh	15	30
	34 [a] ±2.11	34 [a] ±1.07	22 [b] ±1.12
Cumin oil 75ppm	31 [a] ±0.76	28 [b] ±0.55	23 [b] ±0.35
Moringa oil 75ppm	29 [a] ±1.21	30 [b] ±1.01	11 [c] ±1.21
Cumin oil 90ppm	30 [a] ±1.46	32 [a] ±3.21	10 [c] ±2.1
Moringa oil 90ppm	32 [a] ±1.44	34 [a] ±0.07	30 [a] ±0.87

Table (14) Effect of storage period on the appearance color of soft white Cheese:

Treatment	Appearance color (15) storage period		
Control	fresh	15	30
	14 [a] ±1.71	14 [a] ±1.65	9 [b] ±0.31
Cumin oil 75ppm	14 [a] ±0.78	12 [a] ±1.34	10 [b] ±0.91
Moringa oil 75ppm	13 [a] ±0.31	13 [a] ±0.22	7 [c] ±0.11
Cumin oil 90ppm	14 [a] ±3.42	12 [a] ±1.11	7 [c] ±2.21
Moringa oil 90ppm	13 [a] ±1.22	13 [a] ±1.14	12 [a] ±0.82

تأثير اضافه بعض الزيوت النباتية على خواص الجودة الكيميائية والميكروبية والحسية للجبن الأبيض الطري

أ.د/ نهاد رشاد الطحان — أستاذ التغـــــذية وعلوم الأطعمـــــة — كلية الاقتصاد المنزلي - جامعة المنوفية

أ.م.د/ وحيد احمد رجب — أستاذ مساعد معهد بحوث وتكنولوجيا الأغذيه — قسم الألبان

الزهراء سعد عبد الله شنيشن

بكالوريوس اقتصاد منزلي (تغذية وعلوم الأطعمة)

كلية الاقتصاد المنزلي - جامعة الأزهر (٢٠١٠)

الملخص العربي

الجبن البيضاء الطرية تحظى بشعبية على نطاق واسع وهى مـــن منتجـــات الألبـــان الحمضية. ولديها فتره صلاحية محدودة ، والنظافة الصارمة وسلامة المنتج.

وكان الهدف من هذه الدراسة هو تحسين نوعية الجبن الأبيض الطري وإطاله العمـــر الافتراضي (فتره الصلاحية).

تمت إضافة زيت المورينجا إلى الجبن الأبيض الطري بتركيزات ٧٥ و ٩٠ جزء في المليون. وبعد ذلك تم دراسة التركيب الكيميائي، والجـــودة الميكروبيولوجيـــة والخـــواص الحسية للجبن الأبيض الطري طول مده التخزين ٤٥ يوم على درجه حرارة ٥ ± ٢ ° C .

أشارت النتائج أن إضافة زيت المورينجا على جميع المســـتويات لديـــه تـــأثير رائـــع وملحوظ على الدهون، البروتين الكلي، الملح ، محتويات النيتروجين، الرطوبة، قيمـــة PH، الحموضة.

زاد محتوى الحموضة وقيمة PH مع زيادة زيت المورينجا عند مستوى ٩٠ جزء في المليون في حين انخفضت مع زيادة زيت المورينجا عند مستوى ٧٥ جزء في المليون.

* زادت الحموضة تدريجيا في كل المعاملات خلال فترة التخزين.

*زادت نسبة الرطوبة مع زيادة زيت المورينجا عند مستوى ٧٥ جزء في المليون في حين انخفضت مع زيادة زيت المورينجا عند مستوى ٩٠ جزء في المليون.

* زيادة محتوى البروتين الكلي و محتوى النيتروجين مع زيادة زيت المورينجا عند مستوى ٩٠ جزء في المليون في حين انخفضت مع زيادة زيت المورينجا عند مستوى ٧٥ جزء في المليون.

* لا يوجد أي فروق معنوية (P> 0.05٪) بين الدهون والملح لمحتويات الجبن الأبيض الطري طول فترة التخزين ٤٥ يوم على درجه حراره ٥ ± ٢ ° C.

* كما أشارت النتائج إلى أن العد الكلى للبكتريا، والخمائر والفطريات، والبكتيريا القولونية، *psychrophilli bacteria* انخفضت مع زيادة زيت المورينجا عند مستوى ٩٠ جزء في المليون.

* كما أشارت النتائج أيضا إلى أن النكهة، والقوام ومظهر اللون سجلت أعلى درجة عند مستوى ٩٠ جزء في المليون من زيت المورينجا أكثر من مستوى ٧٥ جزء في المليون طوال فترة التخزين على ٥ ± ٢ ° C. لذلك، فى الختام يمكن أن نخلص إلى أن استخدام (MOO) على مستوى ٩٠ جزء فى المليون مع الجبن الأبيض الطرى كمادة حافظة أدى إلى تثبيط النشاط الميكروبي وتحسين فتره الصلاحيه للجبن الأبيض الطرى.

الكلمات المفتاحيه : *زيت المورينجا* – الجبن الطري – العدد الكلي للبكتريا – التقييم الحسي.