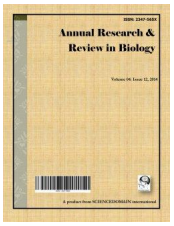

Annual Research & Review in Biology

23(6): 1-7, 2018; Article no.ARRB.38800
ISSN: 2347-565X, NLM ID: 101632869

Development of Yoghurt from Combination of Goat and Cow Milk

Marina Temerbayeva[1], Maksim Rebezov[2,3,4], Eleonora Okuskhanova[5], Oksana Zinina[4], Olga Gorelik[3], Oksana Vagapova[6], Tatiana Beginer[6], Svetlana Gritsenko[6], Ainur Serikova[5] and Zhanibek Yessimbekov[5*]

[1]S. Toraighyrov Pavlodar State University, Pavlodar, Kazakhstan.
[2]Russian Academy of Staffing of Agro-Industrial Complex, Moscow, Russia.
[3]Ural State Agrarian University, Yekaterinburg, Russia.
[4]South Ural State University, Chelyabinsk, Russia.
[5]Shakarim State University of Semey, Kazakhstan.
[6]South Ural State Agrarian University, Chelyabinsk, Russia.

Authors' contributions

This work was carried out in collaboration between all authors. Authors MT, MR and EO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors OZ, OG, OV and TB managed the analyses of the study. Authors SG, AS and ZY managed the literature searches. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/ARRB/2018/38800
Editor(s):
(1) Gunanidhi Dhangadamajhi, Department of Biotechnology, North Orissa University, Baripada, Odisha, India.
(2) George Perry, Dean and Professor of Biology, University of Texas at San Antonio, USA.
Reviewers:
(1) Florencia Frau, Universidad Nacional de Santiago del Estero, Argentina.
(2) Ariwaodo Chinenye, Michael Okpara University of Agriculture, Nigeria.
(3) Farinde Elizabeth Oluremi, Institute of Agricultural Research and Training, Nigeria.
(4) Camila Sampaio Cutrim, Federal Fluminense University, Brazil.
Complete Peer review History: http://www.sciencedomain.org/review-history/23072

Original Research Article

Received 20th November 2017
Accepted 6th February 2018
Published 8th February 2018

ABSTRACT

This study describes the technology of yoghurt preparation from goat and cow milk in combination ratio of 100:0, 70:30, 50:50, 30:70 and 0:100. The formulation of yoghurt includes the mixture of goat and cow milk, pectin LM-106AS and YM-115-L, prebiotic lactitol and *Bifidobacterium* and *Lactobacillus* ferments. Goat milk is a rich source of vitamin A, containing up to 42.3% more than that of cow's milk. Vitamins of B group were not significantly different. In comparison to cow's milk, goat milk had more vitamin C and E. Combination of goat and cow milk improved the sensory

**Corresponding author: E-mail: zyessimbekov@gmail.com;*

parameters of taste, color and flavor. The yoghurt prepared from the mixture of goat and cow milk in proportion of 30:70 contains 2.8% protein, 4.0% fat and 14.2% carbohydrate; satisfies the sensory properties and meet the requirements of standard specification for yoghurts.

Keywords: Goat milk; mixture; pectin; vitamin; yoghurt; chemical composition.

1. INTRODUCTION

Nutrition is an important determinant of physical and mental health of human. Among the wide variety of animal and plant origin food, the most valuable in terms of nutritive and biological quality are milk and milk products. Milk industry plays an important role in national economy and is one of the most foremost sectors of the agro industrial complex. Sour milk products are widely used in human diet due to their health benefits. The production of sour milk products includes fermentation process and therefore the quality of these products depends on the quality of the ferments used in the sour milk composition [1].

Yoghurt is the most popular sour milk products consumed all over the world. Yoghurt is prepared by fermenting skim or whole pasteurized milk with a mixture of *Lactobacillus bulgaricus and Streptococcus thermophilus*. Powdered milk, sugar, fruits and berry are also added. Yoghurt can be developed from whole pure milk, standardized milk, powdered milk and recombined milk. [2]. Milk sugar or lactose is fermented with cultures to obtain lactic acid, which generates the texture and flavor of yoghurt [3]. The consistency and texture of yoghurts can be improved by adding the structure-forming agents, such as pectin, starch and alginate. Pectin is a polysaccharide, which supports the optimal level of cholesterol in blood, improves blood circulation and intestinal peristalsis. Pectin has demonstrated radioprotective properties, removing from the human body toxic elements and long life radionuclides (Sr, Cs et.c.) [4].

Microbial population of human intestinal tract is of great importance for body functioning. The intestinal microflora contains more than 1000 species of bacteria, where most of them are essential for human health [5]. Probiotics play a major role in maintaining the Intestinal tract microbiocenosis, increasing the body resistance to the pathogen microorganism. Probiotics posses immunotropic properties and have effect on antimicrobial activity (decreases pH, inhibs bacterial invasion, prevents adhesion of pathogen microorganism to epithelial cells) [6,7]. *Lactobacterium* and *Bifidobacterium* are one of the largest groups of microbial population, which are widely used in milk industry as ferments. *Lactobacterium* produce lactase (lactase is the enzyme that breaks down lactose) and lactic acid, which reduce viability of pathogenic microbes [8].

In Kazakhstan, goat, mare, and camel milk are widely available [9]. In last decades there is a growing demand on goat milk production. Compared to cow milk, goat milk has more health benefits (improves the bioavailability of nutrients, strengthens immunity, reduces of chronic diseases risks, strengthens bones) and can be used for yoghurt production alone or as a mixture with cow, sheep and mare milk [10]. Goat milk has been used as a health product for a long time. It is known that goat milk is very useful for babies' nutrition [11]. Goat and human milk are similar in amino acid composition [12]. Goat milk is rich in valine, isoleucine and cystine amino acids, the total sum of which is higher than in cow milk (761 mg/100g against 609 mg/100g) [13]. Goat milk fat is fully and easy digestible. Goat milk is a good source of high quality protein, fat, vitamins and mineral elements. In comparison with cow milk, goat milk contains about 13% more of calcium [14], 25% more of vitamin B6, 47% more of vitamin A [15].

Goat milk can be used in treatment of eczema, bronchial asthma, blind headache, liver disease etc. [16]. Goat milk has a strong antirachitic effect because of high content of calcium, phosphorous, copper, cobalt, selenium, magnesium, iron, manganese and sialic acid [17].

The purpose of this study therefore is to develop yoghurt from combination of goat and cow milk and evaluate them for vitamin, chemical and sensory characteristics.

2. MATERIALS AND METHODS

Fresh goat and cow milk was purchased from the local milk farm of Pavlodar region, Kazakhstan and stored at -2 to -4°C before the experiments.

Goat milk was mixed with the cow milk at a ratio of 100:0 (T1); 70:30 (T2); 50:50 (T3); 30:70 (T4) and 0:100 (T5) and heated up to 50-55°C.

2.1 Preparation of Yoghurt

The traditional technology for the production of yoghurt was used as a basis for the experiments, which includes: milk preparation, normalization, pasteurization, homogenization, cooling, fermentation, ripening, mixing and packaging.

The mixture of goat and cow milk was mixed and heated up to 55°C and then normalized. The mixture was then pasteurized at 71.0°C and cooled to 40°C for fermentation process. At this time the ferment including *Bifidobacterium infantis, Bifidobacterium longum, Lactobacillus acidophilus, Lactobacillus bulgaricus, Lactobacillus paracasei, Streptococcus thermophillus*, pectin LM-106 AS-YA and the prebiotic lactitol (1%), Pectin LM-106AS and YM-115-L were used in the formulation of the bio-yoghurt.

The milk mixture was fermented for 6-8h, flavor fillers from pineapple, mango and kiwi were added to the fermented milk. All these ingredients were mixed for 10 min, packed in containers and kept in refrigerator at -2 to -4°C for analysis.

2.2 Sensory Evaluation

Sensory evaluation of the yoghurt samples was done by 9 panellists who are familiar with sensory qualities of youghurt including the color, odor, consistency, and taste. The scores were calculated using a 100-point system where maximum score for taste and flavor was 60 points; structure and consistency was 30 points and color was 10 points.

2.3 Chemical Composition

Fat content was determined using the method described by Gerber [18]. Into a butyrometer, 10 mL of H_2SO_4 (92% w/v), 11 mL of milk and 1 mL of isoamyl alcohol were added.. Then the butyrometer was capped with rubber cap and was vigorously shaken until all particles were melted. Next the butyrometer was placed in water bath set at 60°C for 15 min and centrifuged for 5 min at 1,200 rpm. Separated milk fat was determined using divider.

Protein content was determined using Kjeldahl method in which the total nitrogen was obtained and multiplied with the factor 6.38 [19]. Total solid content was determined by drying the samples at 105°C for 2 h. Lactose was quantified by polarimetry method which was based on the specific rotation of the polarized light due to the asymmetric carbon of lactose described in [20].

2.4 Vitamin Composition Determination

The vitamins were determined by the method reported by Rudenko and Kartsova (2010) [21]. Liquid chromatography was used to quantify the vitamins. The instrument used was a “Shimadzu LC-20 Prominence” liquid chromatography system (Shimadzu, Japan) equipped with fluorometric and spectrophotometric detectors.

2.5 Statistical Analyses

Statistical analysis was performed using Statistica 12.0 (STATISTICA, 2014; StatSoft Inc., Tulsa, OK, USA). The differences between samples were evaluated using ANOVA method. The differences were considered to be statistically significant at $p \leq 0.05$.

3. RESULTS AND DISCUSSION

The chemical composition, physico-chemical and sensory properties of milk depend on the lactation period, breed, age, feeding diet and the live condition of the animal. The data of Table 1 confirms that the content of protein, fat and dry matter was higher in goat milk than in cow milk and replacement of goat milk with cow milk led to the decreasing of fat, protein and dry matter contents.

The proteins of animal and plant origin and food fibers are essential in human diet. In this study, the pectin was used as a source of food fibers. Pectin possesses enterosorbent properties; bind and remove the harmful matters from the body [22].

The vitamin content of the goat and cow milk is presented in Table 2. Goat milk is a rich source of vitamin A, containing up to 42.3% Vitamin A more than that of cow's milk. Vitamins of B group were not significantly different. In comparison to cow's milk, goat milk had more vitamin C and E.

Of particular importance is vitamin A (retinol) in human body. Retinol is called growth vitamin. Lack of vitamin A in human body leads to growth impairment of skeleton, decreases the resistance to infectious diseases, and has a negative effect on the nervous system functioning. Vitamin A helps in activation of epithelization of tissues, useful in helping with night vision and relates to the group of antioxidants [23].

Table 1. Chemical composition of yoghurt with different combination of goat and cow milk

Sample	Index						
	Fat	Dry matter	Nonfat milk solids	Lactose	Protein		
					Total	Casein	Whey protein
T1	5.46±0,13	15.01±0,28	9.62±0,29	4.39±0,11	4.20±0,12	3.32±0,06	0.88±0,02
T2	5.00±0,12	14.25±0,26	9.30±0,22	4.32±0,09	3.93±0,10	3.06±0,10	0.87±0,02
T3	4.65±0,13**	13.68±0,38*	9.03±0,13	4.26±0,12	3.71±0,07**	2.85±0,08	0.86±0,02
T4	4.34±0,11	13.14±0,29*	8.82±0,16	4.21±0,12	3.53±0,07**	2.68±0,10**	0.85±0,02
T5	3.90±0,09**	12.41±0,43*	8.49±0,30*	4.14±0,07*	3.24±0,09**	2.41±0,06**	0.83±0,02

*Significant difference by column *P<0,05; ** P<0,01*

T1 – yoghurt made from goat milk; T2 - yoghurt made from 70% of goat and 30% of cow milk; T3 - yoghurt made from 50% of goat and 50% of cow milk; T4 - yoghurt made from 30% of goat and 70% of cow milk; T5 - yoghurt made from cow milk

Table 2. Vitamin composition of cow and goat milk, mg/100g

Vitamin	Goat milk	Cow milk
Vitamin A (retinol)	0,046±0.002	0,026±0.001*
Vitamin E(tocopherol)	0,061±0.002	0,059±0.002
Vitamin B1(thiamine)	0,032±0.001	0,032±0.001
Vitamin B2(riboflavin)	0,073±0.003	0,075±0.002
Vitamin B6 (pyridoxine)	0,043±0.001	0,042±0.001
Vitamin C (ascorbic acid)	1,522±0.027	1,401±0.020*

*Significant difference *P<0,05*

Vitamin B1 plays a major role in energy production, carbohydrate metabolism and it is vital for the normal development of nervous and cardiovascular systems.

Vitamin C stimulates the oxidation process, the production of collagen and is essential for adrenal functioning while Vitamin C helps the body absorb iron and calcium. It also help in regeneration of vitamin E [24]. Vitamin C deficiency can lead to fatigue, impaired osteoblast activation, reduced collagen synthesis and hair breakage [25].

Result of the sensory evaluation of the yoghurt samples are shown in Table 3. Yoghurt from goat and cow milk in combination ratio of 70:30 had the highest score and acceptability compared to the other yoghurt samples.

3.1 Chemical Composition of the Yoghurt Samples

The chemical composition of yoghurt is depicted in Table 4. The protein, fat and carbohydrate contents ranged from 2.66 to 2.84%, 3.55 to 4.17 to % and 12.75 to 14.57 to %, respectively. Apparently, these variations were due to variation in amount of goat milk in the formulation of yoghurt composition. According to the National Standard GOST 31981-2013 “Yoghurts. General Specification”, the chemical composition of yoghurts should meet the following requirements: fat content should vary from 0.5 to 10% and protein content should not be less than– 2.8% for the yoghurts with fillers. Obtained results revealed that only T1 and T2 samples met the standard requirements on the protein content. T2 sample contains 2.80% protein, 4.0% fat and 14.2% carbohydrate. Similar results were obtained by Les’ et al. (2011) [26], who developed the pasteurzed goat milk enriched with mineral and vitamin additive, oligofructose, biotin and inositol. and the enriched milk contained 2.8%, 3.5% and 1.2% protein, fat and ash respectively. Higher content of protein and fat were observed by Bushueva and Akhtyamova (2014) [27] in fermented milk product for children from goat milk which contained 3.03% protein, 4.6% fat and 6.0% carbohydrates. Protein is a basis of all living beings and during the metabolism performed different functions, including the immunomodulating, antagonist and anticarcinogenic activity and responsible for transportation of fat-soluble vitamins and iron in human body. Milk protein is related to the most valuable and major source of consumable animal protein. It contains essential amino acids [28].Milk fat contains unsaturated fatty acids with short chemical bonds, which are easily digested without forming the cholesterol. During the metabolism milk fat is broken to the simple compounds and produces large amount of energy, which required for human body [29].

Table 3. Sensory evaluation of yoghurt

Indicator	T1 (100/0)	T2 (70/30)	T3 (50/50)	T4 (30/70)	T5 (0/100)
Evaluation score	88	94	93	92	90
Visual appearance	Homogenous, sticky consistency. Flat, smooth surface	Homogenous, sticky consistency, non-stirred yoghurt. The surface and mass is creamy with the presence of insoluble particles of ingredients.	Flat, smooth surface	Flat, smooth surface	Homogenous, sticky consistency Flat, smooth surface
Flavor	Free from abnormal flavors	Free from abnormal flavors, sweet pronounced flavor	Free from abnormal flavors relevant to the flavor of yoghurt ingredients	Free from abnormal flavors relevant to the flavor of yoghurt ingredients	Free from abnormal flavors relevant to the flavor of yoghurt ingredients
Taste	Slightly acidic taste	Sweet taste	Sweet taste	Sweet taste	Sweet taste
Color	White uniformly distributed across the product	Creamy white uniformly distributed across the product	Creamy white uniformly distributed across the product	Intensive white	Intensive white

T1 – yoghurt made from goat milk; T2 - yoghurt made from 70% of goat and 30% of cow milk; T3 - yoghurt made from 50% of goat and 50% of cow milk; T4 - yoghurt made from 30% of goat and 70% of cow milk; T5 - yoghurt made from cow milk

Table 4. Chemical composition of yoghurt

Index	Samples				
	T1 (100/0)	T2 (70/30)	T3 (50/50)	T4 (30/70)	T5 (0/100)
Protein, %	2.84±0.07	2.80±0.05	2.75±0.08	2.70±0.04	2.66±0.07
Fat, %	4.17±0.11	4.00±0.11	3.82±0.12	3.77±0.11	3.55±0.09*
Carbohydrate, %	14.57±0.29	14.20±0.38	13.87±0.28	13.52±0.27**	12.75±0.36**
Caloric value, kcal/100g	107.17	104.00	100.86	98.81	93.59

*Significant different by rows *P< 0.01; **P<0.05*

T1 – yoghurt made from goat milk; T2 - yoghurt made from 70% of goat and 30% of cow milk; T3 - yoghurt made from 50% of goat and 50% of cow milk; T4 - yoghurt made from 30% of goat and 70% of cow milk; T5 - yoghurt made from cow milk

Aside from cow and goat milk, yoghurt can also be made from the milk of other animals. Yoghurt could be made from sheep milk with protein, fat and ash content of 4.85%, 5.65% and 1.16% respectively [30].

In the study [31] was reported that the fat, ash and total solids content in the yoghurt made from buffalo milk was 7.1%, 1.11% and 17.85% respectively, whereas, the yoghurt from soy milk contained 2.4%, 0.76% and 11.37% fat, ash and total solids respectively. The authors [32] studied the effect of honey addition (from 2% to 6%) on yoghurt quality. The contents of fat, ash and total solids in the yoghurt varied with the amount of honey added. They varied from 5.7-5.9%, 0.89-0.90% and 16.98-19.91%, respectively.

The work [33] reported that the chemical composition of probiotic yoghurt made from camel milk was determined and was found to contain 2.72%, 3.54%, 2.39% fat, protein and ash respectively. In [9] the authors studied the chemical composition of ice cream made from the mare and cow milk. The content of protein, fat, carbohydrates and ash were 3.15%, 7.3%, 22.7% and 0.7%, respectively.

4. CONCLUSION

High nutritive and biological value of goat milk allows its use in the formulation of yoghurt. These findings suggest a beneficial role of goat milk in developing yoghurt. A combination of goat and cow milk in yoghurt production resulted in increase in protein and decrease in fat and carbohydrate contents with increase in goat milk in the combination. Goat milk yoghurt was higher in all the vitamins content than cow milk. Sensory evaluation showed that taste, appearance, color and flavor were improved by combination of goat and cow milk than that in the yoghurt made from only goat milk and higher evaluation score was obtained among the treatments with 70% of goat and 30% of cow milk.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Gorelik O, Shatskikh Y, Rebezov M, Kanareikina S, Kanareikin V, Lihodeyevskaya O, Andrushechkina N, Harlap S, Temerbayeva M, Dolmatova I, Okuskhanova E. Study of chemical and mineral composition of new sour milk bio-product with sapropel powder. Annual Research and Review in Biology. 2017;18(4).
   DOI: 10.9734/ARRB/2017/36937
2. Ifeanyi VO, Ihesiaba EO, Muomaife OM, Ikenga C. Assessment of microbiological quality of yogurt sold by street vendors in Onitsha metropolis, Anambra state, Nigeria. British Microbiology Research Journal. 2013;3(2):198-205.
3. Rita E Sanful. The use of tiger-nut (*Cyperus esculentus*), cow milk and their composite as substrates for yoghurt production. Pakistan Journal of Nutrition. 2009;8:755-758.
4. Bepeyeva A, Barros J, Albadran H, Kakimov AK, Kakimova ZK, Charalampopoulos D, Khutoryanskiy VV. Encapsulation of *Lactobacillus casei* into calcium pectinate-chitosan beads for enteric delivery. Journal of food science. 2017;82(12):2954-2959.
5. Onyenweaku F, Obeagu EI, Ifediora AC, Nwandikor UU. Health benefits of probiotics. Int. J. Innovat. Applied Res. 2016;4:21-30.
6. Butel MJ. Probiotics, gut microbiota and health. Médecine et Maladies Infectieuses. 2014;44(1):1–8.
7. Bomba A, Nemcová R, Mudronová D, Guba P. The possibilities of potentiating the efficacy of probiotics. Trends Food Sci. Technol. 2002;13(4):121–126.
8. Kakimov AK, Kakimova ZK, Bepeyeva AY, Khutoryanskiy VV, Yessimbekov ZS. Probiotics. Prebiotics. Synbiotics. Semey; 2015.
9. Akanova A, Kikebayev N, Shaikenova K, Seiitkazhy Z, Okuskhanova E. Nutritive and biological value of mare's milk ice cream. Pakistan Journal of Nutrition. 2017; 16:457-462.
10. Wang C, Zhu Y, Wang J. Comparative study on the heat stability of goat milk and cow milk. Indian Journal of Animal Research. 2016;50(4):610-613.
11. Haenlein GFW. Goat milk in human nutrition. Small Ruminant Research. 2004;51(2):155-163.
12. Daniyarova GM, Gumarova AK, Abuova AB, Suhanberdina FH. Comparative evaluation of sensory and physical and chemical properties of goat and cow milk yoghurt. Young Scientist. 2015;6(3):29-33. In Russian.
13. Park YW. Goat milk: Composition, characteristics. Encyclopedia of Animal Science; 2004.
14. Haenlein GFW. Goat milk in human nutrition. Small Ruminant Research. 2004;51(2):155-163.
15. Agnihotri MK, Prasad VSS. Biochemistry and processing of goat milk and milk products. Small Ruminant Research. 1993;12:151–170.
16. Ribeiro AC, Ribeiro SDA. Specialty products made from goat milk. Small Ruminant Research. 2010;89(2):225-233.
17. Ruprichová L, Králová M, Borkovcová I, Vorlová L, Bedáňová I. Determination of whey proteins in different types of milk. Acta Veterinaria Brno. 2014;83(1):67-72.

18. ISO 11870|IDF 152:2009 - Milk and milk products - Determination of fat content - General guidance on the use of butyrometric methods.
19. Chang SKC. Protein analysis in food analysis. 3rd edition, Kleurer Acesdenine Plenum Publishers, New York; 2003.
20. AOAC. Lactose in milk. Polarimetric method, Method No 896.01-1896. In: Official Methods of Analysis of AOAC International, 18th edn (ed. W.Horowitz). AOAC International, Gaithersburg, MD. 2005;17.
21. Rudenko AO, Kartsova LA. Determination of water-soluble vitamin B and vitamin C in combined feed, premixes and biologically active supplements by reversed-phase HPLC. Journal of Analytical Chemistry. 2010;65(1):71-76.
22. Kakimov A, Kakimova Z, Mirasheva G, Bepeyeva A, Toleubekova S, Jumazhanova M, Zhumadilova G, Yessimbekov Z. Amino acid composition of sour-milk drink with encapsulated probiotics. Annual Research and Review in Biology. 2017;18(1). DOI:10.9734/ARRB/2017/36079.
23. Sowers M, Lachance L. Vitamins and arthritis. The roles of vitamins A, C, D, and E. Rheumatic Diseases Clinics of North America. 1999;25:315–332.
24. Willershausen B, Ross A, Försch M, Willershausen I, Mohaupt P, Callaway A. The influence of micronutrients on oral and general health. European Journal of Medical Research. 2011;16(11):514-518.
25. Devaki SJ, Raveendran RL. Vitamin C: Sources, Functions, Sensing and Analysis. In Amal H. Hamza Vitamin C. InTech; 2017.
26. Les' GM, Khovanova IV, Simonenko SV, Felik SV. Pasteurised dairy product based on goat milk for pregnant and nursing women alimentation. Patent # 2417613 RU. Date of publication: 10.05.2011 Bull. 13. In Russian.
27. Bushueva IS, Akhtyamova DI. Using of biologically active and food additives in the composition of goat sour milk for children nutrition. Bulletin of Kazan Technology University. 2014;17(11):158-162. In Russian.
28. Fox PF. Milk proteins as food ingredients. Int. J. Dairy Technol. 2001;54:41–55.
29. Wong NP, Jenness R, Keeney M, Marth EH (Eds.). Fundamentals of dairy chemistry. Springer US, Boston, MA; 1995.
30. El Zubeir IEM, Babekir R, Shuiep ES. Chemical properties and acceptability of yoghurt made from camel-sheep milk. Proceedings of the 3rd Conference of the International Society of Camel Research and Development, January 29-February 1, Sultanate of Oman. 2012;220-221.
31. Ismail MM, Ghoneem GA, EL- Boraey LNA, Tabekha MM, Elashrey HF. Effect of mixing soy milk with buffalo or cow milk on the chemical composition, microbial properties and sensory evaluation of yoghurt. Journal of Biotechnology Research. 2017;3(7):56-65.
32. Ammar ETM, Ismail MM, Khalil AEWE, Eid MZ. Impact of fortification with honey on some properties of bio-yoghurt. The Journal of Microbiology, Biotechnology and Food Sciences. 2015;4(6):503-508.
33. Kavas N, Kavas G. Probiotic frozen yoghurt production using camel milk (*Camelus dromedarius*) with Improved functions by strawberry guava (*Psidium littorale var. cattleianum*) fortification. British Journal of Applied Science&Technology. 2016;14(5):1-12. DOI: 10.9734/BJAST/2016/23683

Peer-review history:
The peer review history for this paper can be accessed here:
http://www.sciencedomain.org/review-history/23072