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# EFFECTS OF KEFIR AS A PROBIOTIC ON TOTAL LIPID PROFILE AND ACTIVITY OF ASPARTATE AMINO TRANSFERASE AND ALANINE AMINO TRANSFERASE IN SERUM OF HUMAN

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**ABSTRACT : The objective of this study was examined and investigate the effect of varied amounts of kefir fermented in skim milk in concentrations of serum total lipids profile, aspartate amino transferase (AST) and alanine amino transferase (ALT) activities in human volunteers,used seventy five (75) human volunteers and have age (40-50) years were divided into 3 groups including one control and two experimental groups. volunteers in the control group (I) received normal drinking 200ml tap water, group (II) was treated 200ml from 5% kefir and group (III) was given 200ml from 7.5% kefir, respectively. At the end of experiment (21 day), blood samples were collected and analyzed, the results showed serum total lipid profile levels were significantly reduced ($p<0.05$) in groups II and III compared with control group in response to kefir treatment, while observed significant increase in concentration of HDL-C in both groups that treated by kefir in comparison with control group. Moreover, kefir treatment in the groups did not result in any changes in serum AST and ALT activity.**

**The obtained present results demonstrate that use kefir as a probioticsin skim milk lowers the harmful lipids in blood,thus, this research suggesting that use kefir in human diets may have a beneficial effectson health of human body.**

***Key words :*** Kefir, probiotics, lipids profile, AST, ALT.

## INTRODUCTION

Probiotic are defined as live microbial food that benefit human or animals health, the concept of probiotics are at the turn of the 20th century from a hypothesis first proposed by Noble prize winning Russian Scientist Elie Metchnikoff, who suggest that the long healthy life of Bulgarian peasants resulted from their consumption of fermented milk products, he believed that when consumed the fermenting lactic acid bacteria positively influenced on the micro flora of the colon and decreasing toxic microbial activities (Sanders, 1999; Survarna and Boby, 2005).

In Iraq that as became several chronic diseases such as the cancer, hypercholesterolemic, diabetes militates, and the immunity depression diseases which caused to infect the peoples at many pathogenic factors. At the last years it has been looking for used the additives probiotic such as bacteria, yeasts, or molds (Homayouni *et al*, 2012; Lisa, 2009).

Kefir belongs to the probiotic group and containing an alcohol, weakly acidic milky product obtained from kefir grains or via fermentation of milk using a starter culture (Liu and Moon, 1983; Jakobsen and Narvhus, 1996). Microbiologically, kefir contains Lactobacillus (*L. lactis*, *L. helveticus*, *L. casei*), Streptococcus (*S. cremoris, S. lactis*) and yeasts (*Kluyveromyces marxianus*, *Saccharomyces turicensis*, *Pichia fermentans*) species as a starter culture (Ninane *et al*, 2005; Chen *et al*, 2008; Mogheth *et al*, 2017).

It would be beneficial to identify the food additive that could improve using Kefir, it important because is rich in crude protein 45-60%, multi-enzymes, high biological value, vitamin-B complex, biotin, niacin, pantothenic acid, thiamin, minerals and functional ingredients nutrients (Beshkova *et al*, 2003; Lopitz-Otsoa *et al*, 2006; Gaware *et al*, 2011).

There are some studies regarding use of kefir on humans and some animal species. Therefore, this research aims toinvestigated the effects of kefir on total lipid profile and activity of aspartate amino transferase (AST) and alanine amino transferase (ALT) in serum of human and subsequently, the health of body.

## MATERIALS AND METHODS

### Prepare of experimental samples

Kefir grains were obtained from (HiMedia Company, Mumbai, India), then washed with distilled water and inoculated in skimmilk. The kefir beverage was prepared in two concentrations 5%, 7.5% (wt/wt) by inoculated of kefir grains into pasteurized skim milkfermented at 21 hours during incubate at room temperature (25-28°C). After incubation at for 21 hours, the grains were separated from the fermented skim milk by filtration through a suitable sieve (Irigoyen *et al*, 2005). This process was repeated daily throughout the 3 weeks (21 day) of the experimental period.

### Design of experiments and biochemical tests

In this research, 75 volunteers were selected and their ages were ranged between 40 and 50 years, were obtained from a shirqat city. The volunteers were divided into 3 groups,each group included (25) volunteers; group (I) served as the normal control and received drinking 200 ml of tap water,group (II) administered 200 ml from 5% of kefir beverage in skim milk fermented, group (III) received 200 ml from 7.5% of kefir beverage in skim milk fermented, respectively (Forejt *et al*, 2007). The volunteers were give kefir beverage each evening after their evening meal for period of 21 days. In the study, period they were not permitted to consume any other probiotic dairy beverage all through for the experimental period that expanded along between July/September, 2017.

At the end of experiment (21 days), blood samples (5 ml) were collected from the vein of each volunteer. The samples were separated of serum by centrifuging and stored at -20°C until they were analyzed. Serum total lipid profile levels were determined according tothe manufacturers recommended procedure from Biolabo, Randox Laboratories Ltd. (Allain *et al*, 1974; Tietz, 2005). Serum AST and ALT enzymes were determined according to procedure from Randox Laboratories (Reitman and Frankel, 1957).

### Statistical analysis

The statistical analysis was carried out by using statistical packetprogram (SAS Institute, 2001) and comparison between groups were made by using one-way analysis of variance (ANOVA) and tried out the arithmetic means for parameters by using test of duncun multiple range to delimitating significantly differents especially between groups. The level of statistical significance was taken at ($P<0.05$). All data are expressed as mean± standard error (M±S.D) and put above it duncun value (letters).

## RESULTS AND DISCUSSION

The results in Table 1 showed that the volunteer groups, which administrated of 5% and 7.5% of kefir beverage in skim milk fermented, respectively caused a significant decrease ($P<0.05$) in concentrations of serum cholesterol, Triglyceride, LDL-C and VLDL-C, whereas observed significant increase ($P<0.05$) in HDL-C concentration in same groups that gave kefir beverage in comparison with normal control group.

These changes in results of lipids profile in present study may due to the following causes: There are suggestion that reduced the concentration of serum cholesterol, Triglyceride, LDL-C and VLDL-C may be induced by kefir that could be attributed to the fact that the deconjugation of bile acids by *Lactobacillus* spp. and yeast increases a discharge of bile acids, which in turn increases the expenditure of cholesterol to produce bile acids,as well as precipitating of cholesterol due to the low pH value of kefir (Brashears *et al*, 1998; Judiono *et al*, 2011).

In addition, inhibition of 3-hydroxy-3-methylglutaryl-CoA (3-HMG-CoA), which is an intermediate of mevalonate during the synthesis of cholesterol from acetyl-CoA (Liong, 2007; Lye *et al*, 2010), this inhibition may be induced by fermented milk products that produced by kefir has been suggested as the reason for the reduced level of cholesterol in serum. Moreover, fermentation of milk causing of exist the different vitamins, which produced by kefir, especially folic acid and B-complex, thereby, this vitamins lead to increase the activity of metabolic processes of lipids in the liver (Kiessling *et al*, 2002; St-Onge *et al*, 2002; Tietz, 2005), and subsequently, increased the synthesis processes of HDL-C and metabolic destroy of other lipids such as LDL-C and Triglycerides.

Also, in a previous reportrefer to that supplementing rations with probiotics reduced total lipid profile levels

**Table 1 :** Effect of kefir beverage treatment on serum cholesterol, triglycerides, HDL-C, LDL-C and VLDL-C in healthy human volunteers.

| Groups | Cholesterol (mg/dl) | Triglyceride (mg/dl) | HDL-C (mg/dl) | LDL-C (mg/dl) | VLDL-C (mg/dl) |
|---|---|---|---|---|---|
| **Normal control** | 200.0±1.2a | 160.0±2.0a | 30.00±1.7b | 138.0±4.4a | 32.00±1.6a |
| **5% of kefir beverage** | 184.0±3.0b | 151.0±2.3b | 36.00±2.2a | 117.8±5.6b | 30.20±1.3b |
| **7.5% of kefir beverage** | 180.0± 2.9b | 150.0±1.8b | 38.00±2.5a | 112.0±5.0b | 30.00±2.0b |

The values representmean ±S.E. Different lettersverticallymeansignificant differenceat thelevel of significance($P<0.05$).

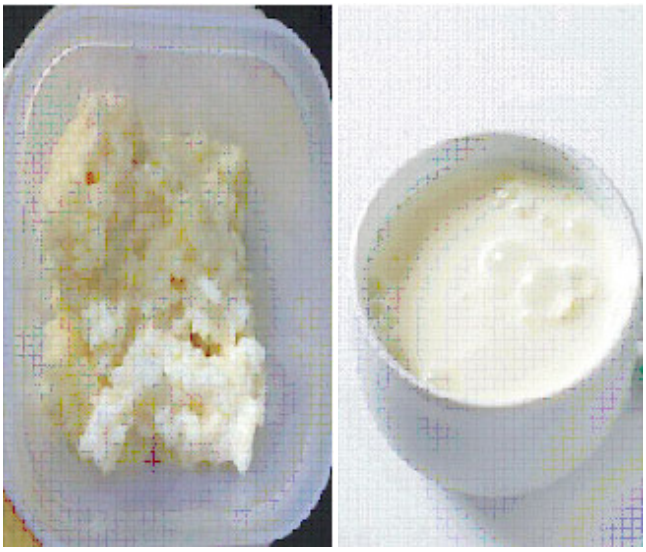

**Fig. 1 :** Kefir grains and kefir beverage with skim milk.

**Table 2 :** Effect of kefir beverage treatment on serum AST and ALT enzymes in healthy human volunteers.

| Groups | AST (IU) | ALT (IU) |
|---|---|---|
| **Normal control** | 42.6±2.0a | 33.1±1.8a |
| **5% of kefir beverage** | 40.5±1.6a | 31.3±1.3a |
| **7.5% of kefir beverage** | 41.0±1.4a | 32.0±1.6a |

The values representmean ±S.E.
Different letters vertically mean significant differenceat the level of significance (P <0.05).

in the serum (Usman, 2000; Chiu-Hsia *et al*, 2006). Indeed, a number of studies have indicated that fermented milk products have been able to decrease total cholesterol (Anderson and Gilliland, 1999; St-Onge *et al*, 2002; Xiao *et al*, 2003; Wang *et al*, 2009).

While the results in Table 2 showed no significant variations in concentrations of AST and ALT enzymes in serum in volunteer groups that administrated of 5% and 7.5% of kefir beverage in skim milk fermented, respectively, in comparison with normal control group.

The liver plays an important role in metabolic processes and the metabolic activity of the liver is important for the normal functions of cellular events. Serum AST and ALT are indicators of normal liver functions (Ramaiah, 2007; Kaoud *et al*, 2011). In this study, there was no change in activities of AST and ALT in all groups. This may be due to that the kefir is a natural antioxidant, therefore, it keeps the liver and spleen functions (Gaware *et al*, 2011). This is consistent with the findings of other researchers (Piva *et al*, 1993; Mohi-Eldin *et al*, 2008). They are demonstrated that yeast probiotics had no effects on activity of enzymes understudy.

In conclusion, this study suggest that from beneficial applications of kefir in humans may due to its effects for reducing a harmful lipids and amelioration of liver functions.

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