Oral Presentation (VPH-4)

The Influence of Medium pH on *Lactobacillus acidophillus* Viability in Soyghurt Tested In Vitro and In Vivo

Lia Siti Halimah[1], Sayu Putu Yuni Paryati[1], Eka Noneng Nawangsih[1]

[1]Microbiology Department, Faculty of Medicine, Universitas Jenderal Achmad Yani

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INTRODUCTION

L. acidophillus bacteria have a high tolerance for acidic atmosphere. This bacterial resistance occurs because the ability to maintain cytoplasmic pH is more alkaline than extracellular pH so that all the different proteins and enzymes in it can still work optimally. *L. acidophillus* bacteria have cell membranes that are more resistant to cell leakage. Cellular membranes consisting of two layers of phospholipid (lipid bilayer) which on each surface of the layer are attached to proteins and lipid bilayer glycoproteins are semipermeable, which will limit the movement of compounds in and out between the cytoplasm and the external environment. The digestive tract has a different pH, starting from the oral cavity with a pH ranging from 6-7 (interval), stomach with pH 1.5-2 (acid), and intestine with a pH of 8-8.9 (base). Many bacteria can live and have habitat in the oral and intestinal cavities, but only certain bacteria are known to survive in the stomach. The nature of bacteria, in general, does not stand in an acidic atmosphere in the stomach, but there are also pathogenic bacteria (detrimental) that are resistant to the acidic atmosphere in the stomach so that it can cause disease in the digestive system. The stomach is an organ of the digestive system which functions to digest food and as the body's defense organ. The body's defense mechanism is carried out by the stomach against bacteria, namely by removing stomach acid. The presence and endurance of *L. acidophillus* bacteria in the stomach have not been reported. Therefore, in this study will be tested the effect of soyghurt containing *L. acidophillus* bacteria on the viability of *L. acidophillus* bacteria in the stomach and its effect on the gastric fluid profile of male Wistar rats.

METHODS

This research is truly experimental. The treatment was by administering soyghurt to rats then observing bacterial growth on the media and rat stomach which was calculated by the total plate count (TPC) method. The incubated soyghurt is then diluted at ten degrees. Colony growth in each dilution in Petri dishes was calculated using a colony counter using the Total Plate Count (TPC) method. Soyghurt is given orally to mice once a day. as much as 3.6 ml / 200g by weight of mice. The 20 of rats was divided into 2 groups, namely 4 control groups and 16 treatment groups. Group 1 was negative control, Group 2 was the treatment group, rats were given soyghurt for 7 consecutive days, then the rats were sacrificed on day 8. The parameters observed were the number of *L. acidophillus* bacteria calculated by TPC and rat gastric fluid profile. Observed data on TPC were tested statistically by the One-Sample T-Test method and data from observations of the gastric fluid profile of male Wistar rats were processed descriptively.

RESULTS AND DISCUSSION

The results of the TPC measurements in vitro on the medium of soyghurt with various pHs against *L. acidophillus* showed that colonies formed inside and appeared on the surface so that MRS-A. The treatment was carried out three repetitions and incubated for 48 hours at 37 ° C, then performed observations that were shown descriptively in the form of tables and figures.

Table 1. Number of *L. acidophillus colonies*. at various pH variations

pH	Repetitions			Average	Explanation
	1	2	3		
	cfu/mL				
2 5 6.5 7	$4,2x10^2$	$4x10^2$	$4,6x10^2$	$4,3x10^2$	growth
	$1x10^7$	$9,6x10^6$	$9,8x10^6$	$9,8x10^6$	growth
	$7,5x10^{15}$	$7 x10^{15}$	$7,7 x10^{15}$	$7,4x10^{15}$	growth
	$3,1x10^9$	$3,2x10^9$	$3,2x10^9$	$3,1x10^9$	growth

Table1 shows that the media of *L. acidophillus* bacteria can grow at pH 2, 5, 6.5, and 7. The most colonies grow at pH 6.5 and at least grow at pH 2. This indicates that pH can affect bacterial growth. For most bacteria, the optimum pH is between 6.5 and 7.5. *Lactobacillus sp*. grows at pH 4.0-7.0 with optimum pH at pH 6.5 and can withstand digestive pH. In vivo TPC measurements

obtained from soyghurt, control group rats and rats in the treatment group for 7 days can be seen in Table 2.

Table 2 TPC Number of *L. acidophillus* bacteria.

Sample	Average of TPC (CFU/ml)
Control Group	0
Treatment Group	$39{,}5x10^{8}$
Soyghurt	$48x10^{18}$

Table 2 shows that descriptively it was seen that the results of TPC on the stomach of the control group mice were not obtained by *L. acidophillus* bacterial colonies. TPC results on rat stomach treatment group when compared with the number of bacteria present in soyghurt decreased, with an average TPC in the stomach of 39.5x108 while that in soyghurt was 48x1018 CFU / ml. This shows the number of bacterial colonies decreased by 99.9%. To find out whether the decrease in the number of bacterial colonies was significant or not, it was tested by one sample t-test.

CONCLUTIONS

Based on the results of research and discussion, it can be concluded as follows: In vitro, *Lactobacillus sp*. can live at pH 2, 5, 6.5, and 7. The most colonies grow at pH 6.5 and at least grow at pH 2. This indicates that pH can affect bacterial growth. In vivo, the TPC results in the stomach rat were 39.5x108 CFU / ml, while in soyghurt it was 48x1018 CFU / ml. This shows the number of bacterial colonies decreased by 99.9%. Based on the results of the One Sample T-Test results p = <0.05 showed a significant decrease in the number of *L. acidophillus* bacteria in the stomach of mice compared to in soyghurt.

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