

Results of our research allowed us to come to the following conclusion.

CONCLUSION

The use of fermented milk product "Narineh" containing *Lactobacillus acidophilus* in food added to the standard scheme antibiotic eradication with sequential De-Nol therapy in patients with peptic ulcer, associated with *Helicobacter pylori* infection, is more effective for eradication of *H. Pylori* infection and significantly reduces the percentage of reinfection and relapse of the disease, which is a special case of the impact of functional foods on disease.

The combination of fermentation milk product "Narineh," containing *Lactobacillus acidophilus* with bismuth subcitrate, doesn't cause a violation of biocenosis of the large intestine, in contrast to the PPI and antibiotics. In addition, it provides the normalization of gut biocenosis and reduces frequency of antibiotic-associated diarrhea and other side effects.

The Novelty of This work: Considering the challenges posed by antibiotic resistance in traditional *Helicobacter pylori* eradication therapies, our study takes a novel approach into the standard conventional triple scheme of eradication therapy. Previous research has highlighted the anti-*Helicobacter pylori* activity of probiotics, including *Lactobacillus acidophilus*. Our study aims to assess the efficiency and incidence of adverse effects in a sequential treatment regimen, presenting a distinct perspective on the utilization of functional foods in the management of peptic ulcer disease associated with Hp infection. Our findings underscore the potential of incorporating "Narineh" into conventional therapy as a well-tolerated and effective strategy for enhancing *Helicobacter pylori* eradication, minimizing adverse effects, and reducing the risk of relapse in patients.

List of Abbreviations: PPI, proton pump inhibitor; A, amoxicillin, C, clarithromycin; RUT, respiratory urea test;

PU, peptic ulcer; Hp, *Helicobacter pylori*; RR- relative risk; IR – immediate risk; RL, relapse.

Competing interests: The authors declare that they have no competing interests.

Authors' contributions: Gagik Yeganyan (GY) and Mkrtich Avakyan (MA) discussed the idea about the additional use of probiotic containing *Lactobacillus acidophilus* to the classical antibacterial therapy in eradication regimens in order to increase the degree of eradication and reduce the incidence of side effects. GY and MA participated in data collection. GA participated in the analysis of the results, drawing of the graphs, and editing and finalizing the manuscript for submission. MA contributed to the study design, the selection of the patients participating in the study, and supervised the project. Emma Yeganyan (EY) participated in the histological and histochemical study of biopsy samples of the gastric mucosa and duodenum taken through gastroduodenoscopy and contributed to writing the abstract and introduction. Tori Trachtenberg (TT) did article improvement and editing, Jiawei (Vivian) Zhou (JZ) provided graphical abstract and formatted the final copy to editorial.

REFERENCES

1. Lee YC, Dore MP, Graham DY. Diagnosis and Treatment of *Helicobacter pylori* Infection. *Annu Rev Med.* 2022 Jan 27; 73:183-195. DOI: <https://doi.org/10.1146/annurev-med-042220-020814>
2. He C, Xie Y, Zhu Y, Zhuang K, Huo L, Yu Y, Guo Q, et al. Probiotics modulate gastrointestinal microbiota after *Helicobacter pylori* eradication: A multicenter randomized double-blind placebo-controlled trial. *Front Immunol.* 2022 Nov 8; 13:1033063. DOI: <https://doi.org/10.3389/fimmu.2022.1033063>
3. Malfertheiner P, Megraud F, O'Morain C, Bazzoli F, El-Omar E, Graham D, Hunt R, et al. Current concepts in the management of *Helicobacter pylori* infection: the Maastricht III Consensus Report. *Gut.* 2007 Jun;56(6):772-81. DOI: <https://doi.org/10.1136/gut.2006.101634>
4. Malfertheiner P, Mégraud F, O'Morain C, Hungin AP, Jones R, Axon A, Graham DY, et al. European *Helicobacter Pylori*

- Study Group (EHPSTG). Current concepts in the management of *Helicobacter pylori* infection--the Maastricht 2-2000 Consensus Report. *Aliment Pharmacol Ther.* 2002 Feb;16(2):167-80. DOI: <https://doi.org/10.1046/j.1365-2036.2002.01169.x>
5. Malfertheiner P, Megraud F, O'Morain C. Guidelines for the Management of *Helicobacter pylori* infection. Summary of the Maastricht 3-2005 Consensus Report. p. 1-4 [www.touchbriefings.com/-pdf71489/Malfertheiner.pdf], retrieved on February 12th, 2024.
 6. Malfertheiner P, Megraud F, O'Morain C, Bazzoli F, El-Omar E, Graham D, Hunt R, et al. Current concepts in the management of *Helicobacter pylori* infection: the Maastricht III Consensus Report. *Gut.* 2007 Jun;56(6):772-81. DOI: <https://doi.org/10.1136/gut.2006.101634>
 7. Malfertheiner P, Megraud F, O'Morain C.A, Atherton J, Axon AT, Bazzoli F, Gensini GF, et al. European *Helicobacter* Study Group. Management of *Helicobacter pylori* infection--the Maastricht IV/ Florence Consensus Report. *Gut.* 2012 May;61(5):646-64. DOI: <https://doi.org/10.1136/gutjnl-2012-302084>
 8. Malfertheiner P, Megraud F, O'Morain CA, Gisbert JP, Kuipers EJ, Axon AT, Bazzoli F, et al. European *Helicobacter* and Microbiota Study Group and Consensus panel. Management of *Helicobacter pylori* infection--the Maastricht V/Florence Consensus Report. *Gut.* 2017 Jan;66(1):6-30. DOI: <https://doi.org/10.1136/gutjnl-2016-312288>
 9. Malfertheiner P, Megraud F, Rokkas T, Gisbert JP, Liou JM, Schulz C, Gasbarrini A, et al. European *Helicobacter* and Microbiota Study group. Management of *Helicobacter pylori* infection: the Maastricht VI/Florence consensus report. *Gut.* 2022 Aug 8;gutjnl-2022-327745. DOI: <https://doi.org/10.1136/gutjnl-2022-327745>
 10. de Moraes Andrade PV, Monteiro YM, Chehter EZ. Third-line and rescue therapy for refractory *Helicobacter pylori* infection: A systematic review. *World J Gastroenterol.* 2023 Jan 14;29(2):390-409. DOI: <https://doi.org/10.3748/wjg.v29.i2.390>
 11. Mladenova I. Epidemiology of *Helicobacter pylori* Resistance to Antibiotics (A Narrative Review). *Antibiotics (Basel).* 2023 Jul 13;12(7):1184. DOI: <https://doi.org/10.3390/antibiotics12071184>
 12. Medakina I, Tsapkova L, Polyakova V, Nikolaev S, Yanova T, Dekhnich N, Khatkov I, et al. *Helicobacter pylori* Antibiotic Resistance: Molecular Basis and Diagnostic Methods. *Int J Mol Sci.* 2023 May 29;24(11):9433. DOI: <https://doi.org/10.3390/ijms24119433>
 13. Bai X, Zhu M, He Y, Wang T, Tian D, Shu J. The impacts of probiotics in eradication therapy of *Helicobacter pylori*. *Arch Microbiol.* 2022 Nov 7;204(12):692. DOI: <https://doi.org/10.1007/s00203-022-03314-w>
 14. Sgouras D, Maragkoudakis P, Petraki K, Martinez-Gonzalez B, Eriotou E, Michopoulos S, Kalantzopoulos G, et al. In vitro and in vivo inhibition of *Helicobacter pylori* by *Lactobacillus casei* strain Shirota. *Appl Environ Microbiol.* 2004 Jan;70(1):518-26. DOI: <https://doi.org/10.1128/AEM.70.1.518-526.2004>
 15. Sgouras DN, Panayotopoulou EG, Martinez-Gonzalez B, Petraki K, Michopoulos S, Mentis A. *Lactobacillus johnsonii* La1 attenuates *Helicobacter pylori*-associated gastritis and reduces levels of proinflammatory chemokines in C57BL/6 mice. *Clin Diagn Lab Immunol.* 2005 Dec;12(12):1378-86. DOI: <https://doi.org/10.1128/CDLI.12.12.1378-1386.2005>
 16. Jonsen-Henru K, Tompkins TA, Sherman PM. *Lactobacillus* species inhibit adherence of Diarrheagenic *Escherichia coli* in host epithelial cells. Presented at international Symposium on Probiotics in Montreal, QC., October 2000, A 245.
 17. Do AD, Su CH, Hsu YM. Antagonistic Activities of *Lactobacillus rhamnosus* JB3 Against *Helicobacter pylori* Infection Through Lipid Raft Formation. *Front Immunol.* 2022 Jan 14; 12:796177. DOI: <https://doi.org/10.3389/fimmu.2021.796177>
 18. Canducci F, Cremonini F, Armuzzi A, Di Caro S, Gabrielli M, Santarelli L, Nista E, et al. Probiotics and *Helicobacter pylori* eradication. *Dig Liver Dis.* 2002 Sep;34 Suppl 2:S81-3. DOI: [https://doi.org/10.1016/s1590-8658\(02\)80172-4](https://doi.org/10.1016/s1590-8658(02)80172-4)
 19. Sheu BS, Wu JJ, Lo CY, Wu HW, Chen JH, Lin YS, Lin MD. Impact of supplement with *Lactobacillus*- and *Bifidobacterium*-containing yogurt on triple therapy for *Helicobacter pylori* eradication. *Aliment Pharmacol Ther.* 2002 Sep;16(9):1669-75. DOI: <https://doi.org/10.1046/j.1365-2036.2002.01335.x>
 20. Sýkora J, Valecková K, Amlerová J, Siala K, Dedek P, Watkins S, Varvarovská J, et al. Effects of a specially designed fermented milk product containing probiotic *Lactobacillus casei* DN-114 001 and the eradication of *H. pylori* in children: a prospective randomized double-blind study. *J Clin Gastroenterol.* 2005 Sep;39(8):692-8. DOI: <https://doi.org/10.1097/01.mcg.0000173855.77191.44>
 21. de Bortoli N, Leonardi G, Ciancia E, Merlo A, Bellini M, Costa F, Mumolo MG, et al. *Helicobacter pylori* eradication: a randomized prospective study of triple therapy versus triple therapy plus lactoferrin and probiotics. *Am J Gastroenterol.* 2007 May;102(5):951-6.

- DOI: <https://doi.org/10.1111/j.1572-0241.2007.01085.x>
22. Mrda Z, Zivanović M, Rasić J, Gajin S, Somer L, Trbojević S, Majoros J, et al. [Therapy of *Helicobacter pylori* infection using *Lactobacillus acidophilus*]. *Med Pregl*. 1998 Jul-Aug;51(7-8):343-5
23. Shen S, Ren F, Qin H, Bukhari I, Yang J, Gao D, Ouwehand AC, et al. *Lactobacillus acidophilus* NCFM and *Lactiplantibacillus plantarum* Lp-115 inhibit *Helicobacter pylori* colonization and gastric inflammation in a murine model. *Front Cell Infect Microbiol*. 2023 Aug 9; 13:1196084.
DOI: <https://doi.org/10.3389/fcimb.2023.1196084>
24. Chen YH, Tsai WH, Wu HY, Chen CY, Yeh WL, Chen YH, Hsu HY, et al. Probiotic *Lactobacillus* spp. act Against *Helicobacter pylori*-induced Inflammation. *J Clin Med*. 2019 Jan 14;8(1):90. DOI: <https://doi.org/10.3390/jcm8010090>
25. He C, Kong F, Chai X, Zou C, Zhu X, Zhao D. Effect of Probiotic-Assisted Eradication of *cagA*+/*vacA* s1m1 *Helicobacter pylori* on Intestinal Flora. *Biomed Res Int*. 2022 Apr 29; 2022:8607671.
DOI: <https://doi.org/10.1155/2022/8607671>
26. Baryshnikova NV, Ilna AS, Ermolenko EI, Uspenskiy YP, Suvorov AN. Probiotics and autoprobiotics for treatment of *Helicobacter pylori* infection. *World J Clin Cases*. 2023 Jul 16;11(20):4740-4751.
DOI: <https://doi.org/10.12998/wjcc.v11.i20.4740>
27. Xu W, Xu L, Xu C. Relationship between *Helicobacter pylori* infection and gastrointestinal microecology. *Front Cell Infect Microbiol*. 2022 Aug 18; 12:938608.
DOI: <https://doi.org/10.3389/fcimb.2022.938608>
28. Koga Y. Microbiota in the stomach and application of probiotics to gastroduodenal diseases. *World J Gastroenterol*. 2022 Dec 21;28(47):6702-6715.
DOI: <https://doi.org/10.3748/wjg.v28.i47.6702>
29. Francavilla R, Polimeno L, Demichina A, Maurogiovanni G, Principi B, Scaccianoce G, Ierardi E, et al. *Lactobacillus reuteri* strain combination in *Helicobacter pylori* infection: a randomized, double-blind, placebo-controlled study. *J Clin Gastroenterol*. 2014 May-Jun;48(5):407-13.
DOI: <https://doi.org/10.1097/MCG.0000000000000007>
30. Tongtawee T, Dechsukhum C, Leeanansaksiri W, Kaewpitoon S, Kaewpitoon N, Loyd RA, Matrakool L, et al. Improved *Helicobacter pylori* Eradication Rate of Tailored Triple Therapy by Adding *Lactobacillus delbrueckii* and *Streptococcus thermophilus* in Northeast Region of Thailand: A Prospective Randomized Controlled Clinical Trial. *Gastroenterol Res Pract*. 2015; 2015:518018.
DOI: <https://doi.org/10.1155/2015/518018>
31. Rebrova O.U.: Statistical analysis of medical data. Application of the application package STATISTICA – M. Media Source, 2006, 312 pp.
32. Paoluzi P, Iacopini F, Crispino P, Nardi F, Bella A, Rivera M, Rossi P, et al. 2-week triple therapy for *Helicobacter pylori* infection is better than 1-week in clinical practice: a large prospective single-center randomized study. *Helicobacter*. 2006 Dec;11(6):562-8. DOI: <https://doi.org/10.1111/j.1523-5378.2006.00459.x>
33. Fuccio L, Minardi ME, Zagari RM, Grilli D, Magrini N, Bazzoli F. Meta-analysis: duration of first-line proton-pump inhibitor based triple therapy for *Helicobacter pylori* eradication. *Ann Intern Med*. 2007 Oct 16;147(8):553-62. DOI: <https://doi.org/10.7326/0003-4819-147-8-200710160-00008>
34. Usta Y, Saltik-Temizel IN, Demir H, Uslu N, Ozen H, Gurakan F, Yuce A. Comparison of short- and long-term treatment protocols and the results of second-line quadruple therapy in children with *Helicobacter pylori* infection. *J Gastroenterol*. 2008;43(6):429-33.
DOI: <https://doi.org/10.1007/s00535-008-2187-4>
35. McLoughlin RM, O'Morain CA, O'Connor HJ. Eradication of *Helicobacter pylori*: recent advances in treatment. *Fundam Clin Pharmacol*. 2005 Aug;19(4):421-7.
DOI: <https://doi.org/10.1111/j.1472-8206.2005.00340.x>
36. Scaccianoce G, Hassan C, Panarese A, Piglionica D, Morini S, Zullo A. *Helicobacter pylori* eradication with either 7-day or 10-day triple therapies, and with a 10-day sequential regimen. *Can J Gastroenterol*. 2006 Feb;20(2):113-7.
DOI: <https://doi.org/10.1155/2006/258768>
37. Vaira D, Zullo A, Ricci C, Gigliotti F, Morini S. H. *pylori* eradication following sequential regimen -5-day dual plus 5-day triple therapy. *Recenti progressi in medicina*, 2007, 98 (11): 574-582.
38. Jafri NS, Hornung CA, Howden CW. Meta-analysis: sequential therapy appears superior to standard therapy for *Helicobacter pylori* infection in patients naive to treatment. *Ann Intern Med*. 2008 Jun 17;148(12):923-31. DOI: <https://doi.org/10.7326/0003-4819-148-12-200806170-00226>
39. Essa AS, Kramer JR, Graham DY, Treiber G. Meta-analysis: four-drug, three-antibiotic, non-bismuth-containing "concomitant therapy" versus triple therapy for *Helicobacter pylori* eradication. *Helicobacter*. 2009 Apr;14(2):109-18. DOI: <https://doi.org/10.1111/j.1523-5378.2009.00671.x>
40. Vakil N. *Helicobacter pylori* treatment: a practical approach. *Am J Gastroenterol*. 2006 Mar;101(3):497-9.
DOI: <https://doi.org/10.1111/j.1572-0241.2006.00454.x>

41. Sopena E, Canadell L, Qanneta R. Bismuth subcitrate as treatment of diarrhea in fragile patients with SARS-CoV-2 infection. *Med Clin (Engl Ed)*. 2022 Nov 11;159(9):453-454. DOI: <https://doi.org/10.1016/j.medcle.2022.10.002>
42. Shin DW, Cheung DY, Song JH, Choi K, Lim J, Lee HH, Kim JI, et al. The benefit of the bismuth add-on to the 2-week clarithromycin-based triple regimen for *Helicobacter pylori* eradication: a propensity score-matched retrospective study. *Gut Pathog*. 2023 Mar 19;15(1):13. DOI: <https://doi.org/10.1186/s13099-023-00539-y>
43. Zagari RM, Dajti E, Cominardi A, Frazzoni L, Fuccio L, Eusebi LH, Vestito A, et al. Standard Bismuth Quadruple Therapy versus Concomitant Therapy for the First-Line Treatment of *Helicobacter pylori* Infection: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *J Clin Med*. 2023 May 3;12(9):3258. DOI: <https://doi.org/10.3390/jcm12093258>
44. Zhou L, Lu H, Song Z, Lyu B, Chen Y, Wang J, Xia J, et al. 2022 Chinese national clinical practice guideline on *Helicobacter pylori* eradication treatment. *Chin Med J (Engl)*. 2022 Dec 20;135(24):2899-2910. DOI: <https://doi.org/10.1097/CM9.0000000000002546>
45. Viazis N, Argyriou K, Kotzampassi K, Christodoulou DK, Apostolopoulos P, Georgopoulos SD, Liatsos C, et al. A Four-Probiotics Regimen Combined with A Standard *Helicobacter pylori*-Eradication Treatment Reduces Side Effects and Increases Eradication Rates. *Nutrients*. 2022 Feb 1;14(3):632. DOI: <https://doi.org/10.3390/nu14030632>
46. Luo Q, Liu N, Pu S, Zhuang Z, Gong H, Zhang D. A review on the research progress on non-pharmacological therapy of *Helicobacter pylori*. *Front Microbiol*. 2023 Mar 17;14:1134254. DOI: <https://doi.org/10.3389/fmicb.2023.1134254>
47. Muacevic A, Adler JR. From Antibiotic Resistance to Antibiotic Renaissance: A New Era in *Helicobacter pylori* Treatment. *Cureus*. 2023 Mar; 15(3): e36041 Published online 2023 Mar 12. DOI: <https://doi.org/10.7759/cureus.36041>
48. Elghannam MT, Hassanien MH, Ameen YA, Turkey EA, ELattar GM, ELRay AA, ELTalkawy MD. *Helicobacter pylori* and oral-gut microbiome: clinical implications. *Infection*. 2023 Nov 2. DOI: <https://doi.org/10.1007/s15010-023-02115-7>
49. Vilaichone R, Mahachai V, Tumwasorn S, Pongpun Nunthapisud P, Pinit Kullavanijaya P. Inhibitory effect of *Lactobacillus acidophilus* on *Helicobacter pylori* in peptic ulcer patients: in vitro study. *J Med Assoc Thai*. 2002 Jun;85 Suppl 1: S79-84.
50. Naghibzadeh N, Salmani F, Nomiri S, Tavakoli T. Investigating the effect of quadruple therapy with *Saccharomyces boulardii* or *Lactobacillus reuteri* strain (DSMZ 17648) supplements on eradication of *Helicobacter pylori* and treatments adverse effects: a double-blind placebo-controlled randomized clinical trial. *BMC Gastroenterol*. 2022 Mar 7;22(1):107. DOI: <https://doi.org/10.1186/s12876-022-02187-z>
51. Kesavelu D, Jog P. Current understanding of antibiotic-associated dysbiosis and approaches for its management. *Ther Adv Infect Dis*. 2023 Feb 24; 10:20499361231154443. DOI: <https://doi.org/10.1177/20499361231154443>
52. Liu M, Gao H, Miao J, Zhang Z, Zheng L, Li F, Zhou S, et al. *Helicobacter pylori* infection in humans and phytotherapy, probiotics, and emerging therapeutic interventions: a review. *Front Microbiol*. 2024 Jan 10;14:1330029. DOI: <https://doi.org/10.3389/fmicb.2023.1330029>
53. Al-Fakhry OM, Elekhawy E. *Helicobacter pylori* in the post-antibiotics era: from virulence factors to new drug targets and therapeutic agents. *Arch Microbiol*. 2023 Aug 7;205(9):301. DOI: <https://doi.org/10.1007/s00203-023-03639-0>
54. Yadegar A, Nabavi-Rad A, Smith SM. Editorial: *Helicobacter pylori* infection and antibiotic resistance: clinical, translational and experimental studies. *Front Cell Infect Microbiol*. 2023 Oct 2; 13:1296784. DOI: <https://doi.org/10.3389/fcimb.2023.1296784>
55. Keikha M, Karbalaee M. Probiotics as the live microscopic fighters against *Helicobacter pylori* gastric infections. *BMC Gastroenterol*, 2021; 21:388. DOI: <https://doi.org/10.1186/s12876-021-01977-1>
56. Yang R., Zhao X, Wu W., Shi J. Potential of probiotics for use as functional foods in patients with non-infectious gastric ulcer. *Trends in Food Science and Technology*. 2021 May; 111:463-474. DOI: <https://doi.org/10.1016/j.tifs.2021.02.070>
57. Dahiya D and Nigam PS. Antibiotic-Therapy-Induced Gut Dysbiosis Affecting Gut Microbiota-Brain Axis and Cognition: Restoration by Intake of Probiotics and Synbiotics. *Int J Mol Sci*. 2023 Feb 4; 24(4):3074. DOI: <https://doi.org/10.3390/ijms24043074>
58. Fishbein SRS, Mahmud B, Dantas G. Antibiotic perturbations to the gut microbiome. *Nat Rev Microbiol*. 2023 Dec;21(12):772-788. DOI: <https://doi.org/10.1038/s41579-023-00933-y>
59. Wang L, Yao H, Tong T, Lau K, Leung SY, Ho JWK, Leung WK. Dynamic changes in antibiotic resistance genes and gut

- microbiota after Helicobacter pylori eradication therapies. Helicobacter. 2022 Apr;27(2):e12871.
DOI: <https://doi.org/10.1111/hel.12871>
60. Martirosyan D, Kanya H, Nadalet C. Can functional foods reduce the risk of disease? Advancement of functional food definition and steps to create functional food products. Functional Foods in Health and Disease 2021; 11(5): 213-221. DOI: <https://doi.org/10.31989/ffhd.v11i5.788>
61. Martirosyan D, von Brugger J, Bialow S. Functional food science: Differences and similarities with food science. Functional Foods in Health and Disease, 2021, 11(9), 408-430. DOI: <https://doi.org/10.31989/ffhd.v11i9.831>
62. Majiene D, Trumbeckaite S, Pavilionis A, Savickas A, Martirosyan DM. Antifungal and antibacterial activity of propolis. Current Nutrition and Food Science, 2007, 3(4), 304–308.
DOI: <https://doi.org/10.2174/1573401310703040304>
63. Zampini IC, Salas AL, Maldonado LM, Simirgiotis MJ, Isla MI. Propolis from the Monte Region in Argentina: A Potential Phytotherapeutic and Food Functional Ingredient. Metabolites. 2021 Jan 28;11(2):76.
DOI: <https://doi.org/10.3390/metabo11020076>
64. Gao H, Li X, Chen X, Hai D, Wei C, Zhang L, Li P. The Functional Roles of Lactobacillus acidophilus in Different Physiological and Pathological Processes. J Microbiol Biotechnol. 2022 Oct 28; 32(10):1226-1233.
DOI: <https://doi.org/10.4014/jmb.2205.05041>
65. Kussmann M and Cunha DHA. Nature has the answers: Discovering and validating natural bioactives for human health. Bioactive Compounds in Health and Disease 2022; 5(10): 222-234.
DOI: <https://www.doi.org/10.31989/bchd.v5i10.1000>
66. Nyotohadi D and Kok T. Potential of multi-strain probiotics extract as an anti-inflammatory agent through inhibition of macrophage migration inhibitory factor activity. Functional Foods in Health and Disease 2022; 13(1): 1-10.
DOI: <https://www.doi.org/10.31989/ffhd.v13i1.1033>
67. Abdul Hakim BN, Xuan NJ, Oslan SNH. A Comprehensive Review of Bioactive Compounds from Lactic Acid Bacteria: Potential Functions as Functional Food in Dietetics and the Food Industry. Foods. 2023 Jul 27;12(15):2850.
DOI: <https://doi.org/10.3390/foods121528500>
68. Martirosyan D, Sanchez SS. Establishment of dosage and time of consumption of functional food products: Quantum and Tempus Theories of Functional Food Science. Functional Food Science 2022; 2(11): 258-279.
DOI: <https://doi.org/10.31989/ffs.v2i11.1012>
69. Leem C. and Martirosyan DM. The bioactive compounds of probiotic foods/supplements and their application in managing mental disorders. Bioactive Compounds in Health and Disease 2019; 2(10): 206-220.
DOI: <https://doi.org/10.31989/bchd.v2i10.431>
70. Louis-Jean S and Martirosyan D. Nutritionally Attenuating the Human Gut Microbiome to Prevent and Manage Metabolic Syndrome. Journal of Agricultural and Food Chemistry, 2019, 67(46), 12675–12684.
DOI: <https://doi.org/10.1021/acs.jafc.9b04879>
71. Nikolaevsky VA, Martirosyan DM, Muzalevskaya EN, Miroshnichenko LA, Zolodov VI. Hepatotropic, antioxidant and antitoxic action of amaranth oil. Functional Foods in Health and Disease, 2014, 4(5), 159–171.
DOI: <https://doi.org/10.31989/ffhd.v4i5.18>
72. Soheilipour M, Tabesh E, Najmi S, Raisi M, Adibi P. Evaluation and comparison of therapeutic effects of probiotics and colloidal bismuth subcitrate on abdominal bloating. Caspian J Intern Med. 2023 Summer;14(3):518-525.
DOI: <https://doi.org/10.22088/cjim.14.3.518>