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**АКТУАЛЬНІ ПИТАННЯ  
КЛІНІЧНОЇ ФАРМАКОЛОГІЇ ТА КЛІНІЧНОЇ ФАРМАЦІЇ  
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## PROBIOTICS IN REDUCING CARDIOVASCULAR RISK FACTORS: A SCOPING REVIEW

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**Background:** Cardiovascular (CV) diseases are responsible for one-third of all deaths globally. Early assessment and prevention of CV risk are essential to reducing these deaths. Gut microbiota and its metabolites demonstrated benefits in reducing systemic inflammation and normalization of lipid profile. Probiotics may contribute to lowering CV risk by optimizing the gut-heart axis.

**Purpose:** to evaluate the potential of probiotics to reduce CV risk factors.

**Methods:** We searched the MEDLINE database via PubMed and the Cochrane Library for Randomized Controlled Trials (RCTs) that investigated the potential of probiotics to reduce CV risk factors. This search encompassed studies published from 2015 to February 2025. We screened the titles and abstracts of these studies and then assessed the full texts for inclusion based on pre-defined criteria.

**Results:** Among the 101 selected RCTs, many studies have been conducted on small numbers of participants and show results with insufficiently certain statistical significance. Finally, 6 RCTs were included in the review. Lactobacillus and Bifidobacterium strains were predominant in probiotics. Only 1 RCT was a multicenter study with 69 healthy elderly. It found that adding probiotics with 112 billion lyophilized bacteria (*B. infantis*, *B. longum*, *B. breve*, *L. acidophilus*, *L. delbrückii* ssp. *bulgaricus*, *L. paracasei*, *L. plantarum*, and *Streptococcus thermophilus*) to a healthy diet for 8 weeks (twice daily) led to reduced homocysteine and increased folate and vitamin B<sub>12</sub> levels ( $p < 0.01$ ). However, this approach was not more effective than a healthy diet alone in lowering total cholesterol (TC), glucose, and high-sensitivity C-reactive protein (hsCRP) levels.

A study of 58 adults with metabolic syndrome (MetS) showed that daily probiotics (1 billion *L. paracasei* and 1 billion *B. animalis*) for 12 weeks significantly reduced body weight, body mass index, waist circumference, systolic blood pressure, TC, and low-density lipoprotein cholesterol (LDLC) compared to vegetable-based pellets ( $p < 0.01$ ). Additionally, in another study with 99 obese women, daily supplementation of over 5 billion *B. lactis* for 12 weeks decreased the atherogenic index of plasma ( $p < 0.05$ ), reduced total fat mass by 2.6 times, especially in postmenopausal women, and decreased trunk fat mass by 7 times vs. placebo.

Furthermore, a study of 94 healthy adults indicated that 4-week daily supplementation with 1 billion *Bacillus subtilis* significantly reduced TC ( $p < 0.05$ ) and non-high-density lipoprotein cholesterol ( $p < 0.01$ ) compared to 1 billion *B. lactis*. Moreover, 12-week daily supplementation with 1.2 billion *L. plantarum* in 86 adults with mild hypercholesterolemia significantly reduced LDLC ( $p < 0.01$ ) vs. placebo. Lastly, 3-month therapy with *Saccharomyces boulardii* (1000 mg per day)

for chronic systolic heart failure outpatients significantly reduced creatinine, uric acid, and hsCRP ( $p < 0.05$ ) vs. placebo.

**Conclusions:** Probiotics may help reduce some CV risk factors, but direct evidence of significant risk reduction is limited. Larger, long-term studies are needed to confirm these findings.

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