PREFACE

Praise be to God Almighty for His infinite blessings, guidance, and strength, which have enabled the author to complete this undergraduate thesis entitled *"*Effects of Dietary Bacillus subtilis var. natto on Growth Performance and Lysozyme Gene Expression in Nile Tilapia (*Oreochromis niloticus*) Infected with *Flavobacterium (columnare) oreochromis."* This research was conducted from November 2024 to May 2025 at Center for Excellence for Shrimp Molecular Biology and Biotechnology (CENTEX SHRIMP), Mahidol University, Thailand. This research is submitted as part of the requirements for the completion of a Bachelor's degree in Biotechnology, Faculty of Science and Mathematics, Diponegoro University.

The study specifically explores the use of *Bacillus subtilis var. natto* as a probiotic supplement in Nile tilapia feed, focusing on its potential to enhance growth performance, reduce mortality during infection, and modulate immune responses, particularly lysozyme gene expression. By employing both growth performance indicators and molecular analysis, this thesis aims to provide a comprehensive understanding of the role of probiotics as a natural, safe, and effective alternative to antibiotics in fish farming.

The author is fully aware that this thesis is far from perfect and still contains many shortcomings, both in terms of methodology and analysis. Various constraints during the research process may also have limited the depth of certain discussions. Therefore, constructive criticism and suggestions from readers are sincerely welcomed as a means to improve future work and strengthen the scientific value of this research.

Semarang, 20 August 2025

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