CHAPTER V. CONCLUSION AND SUGGESTION

5.1 Conclusion

The conclusion of this study is as follows:

1. Supplementation of 39.42% protein of Lima Bean Flour and Patin Fish Flour (LBPF) significantly increased the epidermis thickness by about 1.4 times and dermis thickness by about 2.8 times compared to the malnourished group. These findings even surpassed those of the normal group, indicating a strong restorative effect of LBPF against structural skin damage caused by malnutrition.
2. Supplementation of a combination of Lima Bean Flour and Patin Fish Flour (LBPF) was shown to have a significant regenerative effect on the dermis tissue of malnourished rat skin. Giving a dose of 39.42% protein of LBPF can increase the number of fibroblast cells by about 1.4 times compared to the malnutrition group. In addition, the percentage of collagen in this group also increased almost equivalent to the normal group and much higher than the malnutrition group. These results confirm that LBPF has the potential to be an effective nutritional intervention in improving skin tissue structure through stimulating fibroblast proliferation and increasing collagen synthesis.
3. Supplementation of 31.71% protein and 39.42% protein of Lima Bean Flour and Patin Fish Flour (LBPF) significantly reduced the number of inflammatory cells in the dermis by approximately 1.6 and 2.6 times compared to the malnourished group. These findings demonstrate that nutritional intervention using plant- and animal-based protein sources can effectively restore immune homeostasis and promote the resolution of inflammation in skin tissue affected by malnutrition.

5.2 Suggestion

1. Further research is needed to investigate the molecular pathways involved in skin structural repair following LBPF supplementation, such as the expression of collagen-related genes (COL1A1, COL3A1), TGF-β, as well as the mTOR signaling pathways, in order to clarify the relationship between increased fibroblast numbers, collagen deposition, and tissue thickness.
2. The observed inflammatory cell count should be validated using immunohistochemical methods to identify the dominant immune cell types (e.g., neutrophils, macrophages M1/M2, lymphocytes), and to assess the transition toward pro-resolution (anti-inflammatory) phenotypes.