

CHAPTER V. CONCLUSIONS

A. Conclusions

Based on the data processing and analysis conducted to address the research questions, the following conclusions were drawn:

1. Based on the risk identification of the hydroponic pak choi production process using a fishbone diagram, Binara Hydroponic has identified 16 causes of risk. Within the seeding process, 2 causes of risk were identified, while the planting process revealed 2 causes, the maintenance process disclosed 8 causes, the harvesting process presented 2 causes, and the packaging process showcased 3 causes. Subsequently, at Arif Hidrofarm, a total of 25 causes of risk were identified. Specifically, in the seeding process, 6 causes of risk were observed, in the planting process, 4 causes were noted, within maintenance, 10 causes were recognized, the harvesting process uncovered 2 causes, and the packaging process displayed 3 causes.
2. Risk measurement in the hydroponic pak choi production process employs the FMEA method and Diagram Pareto, identifying critical risks with cumulative percentages equal to or less than 80%. In Binara Hydroponic, 7 risk factors with the highest RPN values were identified: Aphids (*Myzus persicae*) (RPN 100), Spider mites (RPN 80), Caterpillars (RPN 75), Root rot disease (RPN 24), Moss growth on rockwool (RPN 20), Leaf scorch on pak choi (RPN 20), and pak choi being damaged (RPN 20). Conversely, Arif Hidrofarm identified 11 highest RPN risk factors: Nutrient flow disruption (RPN 100), Aphids (*Myzus persicae*) (RPN 100), Spider mites (RPN 100), Presence of moss on rockwool (RPN 80), Moss growth on the main installation (RPN 80), Late arrival of nutrient solution (RPN 64), Caterpillar (RPN 45), Lack of orders (RPN 40), Presence of moss in the nursery rack (RPN 30), Root rot disease (RPN 24), and Seedlings stored for too long in the seeding flannel (RPN 20).

3. The control strategies employed to address critical risks encompass both preventive and mitigative measures. Preventive Strategies implemented is for seeding, control strategies involve Establishing an Optimal Seedling Schedule and Establishing an Appropriate Schedule Pattern. Planting-related risk control strategies include Optimizing Light Conditions and Temperature Management in Hydroponic Pak choi Cultivation. Maintenance risk control strategies entail Utilizing Tobacco Leaf Infusion as a Natural Pesticide for Controlling Spider Mite Pests, Wild Betel Fruit Extract: Potential as Natural Insecticide for aphids, Utilizing Papaya Leaves as Natural Insecticide for Caterpillar Control on pak choi, Effective Biological Control of Root Rot Disease using *Gliocladium catenulatum*, and Efficient Nutrient Procurement Management in Hydroponic Systems. Lastly, harvesting risk control strategies involve Preventive Strategies for strategies to minimize physical damage to pak choi and Increasing Sales and Distribution: Building the Arif Hidrofarm Brand in Supermarket Markets and Contract farming. Mitigation implemented is Backup Power System and scheduling Regular Cleaning of Drip Lines and Installations.

B. Recommendations

Based on the research findings, the following recommendations can be provided:

1. Recognizing the importance of employing preventive and mitigation strategies is crucial for controlling the causes of risk in hydroponic pak choi production at Binara Hydroponic and Arif Hidrofarm. Preventive and mitigation strategies aim to preempt the occurrence of risk factors in the production of hydroponic pak choi at both farms. Therefore, hydroponic farmers in these establishments should consider implementing the preventive strategies formulated in this study.
2. Binara Hidrofarm needs to implement effective control strategies to prevent or reduce the risk of pests and diseases, including the use of biological control agents and sanitation practices, to mitigate production risks that could adversely affect the company. Arif Hidrofarm, as the

current owner, should consider hiring employees with expertise in production management, particularly for supervisory and control tasks in production activities. This would help to mitigate risks associated with operational errors, thereby enhancing the quality and quantity of hydroponic pak choi products.

3. Subsequent research could further develop this study by employing alternative risk analysis methods and examining additional risks such as price or market risks at a broader business practitioner level as well as towards end consumers of hydroponic pak choi products, both from a business management perspective and consumer standpoint.

