



MINDANAO STATE UNIVERSITY AT NAAWAN
Pedro Pagalan St., Poblacion, Naawan, Misamis Oriental

**Piggery Livestock Knowledge-Based System:
Health Decision Support**

A Capstone Project

Presented to the Faculty of

Department of Information Technology

College of Science and Environment

Mindanao State University at Naawan

Poblacion, Naawan Misamis Oriental 9023 Philippines

In Partial Fulfillment

of the Requirement for the Degree

of Bachelor of Science in Information Technology

Major in Database System

Miguel Emmanuel A. Regino

Jerald B. Remullo

Marvin T. Villanea

July, 2022

TABLE OF CONTENT

1. INTRODUCTION

1.1 Background of the Project

1.2 Statement of the Problem

1.3 Research Objectives

1.3.1 General Objective

1.3.2 Specific Objective

1.4 Scope and Limitation

1.4.1 Scope of the Study

1.4.2 Limitation of the Project

1.5 Significance of the Studies

Introduction

In this chapter, the project context, research objectives, and objectives of the study are discussed. The general purposes are also listed and the scope and limitations are described.

1.1 Background of the Project

Swine production in the Philippines is a P191-billion industry and is the largest among the livestock and poultry industries in the country. It ranks next to rice, with an 18.28% contribution to the total value of agricultural production. Swine production plays a major role in ensuring the country's food security by providing about 60% of the total animal meat consumption of Filipinos. The Philippine swine industry is ranked eighth in the world in terms of the volume of pork production and number of breeding sows. However, the majority, or about 65% of the pigs in the Philippines, are kept by smallholder pig raisers. (Livestock Research Division, DOST-PCAARRD S&T Media Service, 2016).

Despite being dynamic and technologically advanced, the local pig industry is still confronted with inefficiencies in production due to low productivity, high mortality due to inefficient diagnostic tools, improvement, and utilization initiatives.

The Philippines Livestock management practices in the marginal upland areas are diverse in terms of type of animals raised, animal health practices, feeding and feed resources, pasture management, available pasture forages and others. Evaluation of these particular livestock husbandry practices is important to have a baseline data and

information on the traditional and present management practices of the farmers in rearing livestock (Warren D. Come and Philippine Dianne Zamora, 2014).

Precision Livestock Farming (PLF) is defined as “individual animal management by continuous real-time monitoring of health, welfare, production/reproduction, and environmental impact” (Berckmans, 2017). PLF includes the combined application of single or multiple tools in integrated systems. This has been made possible by technological developments over the last 20 years in fields such as information and communication technologies, internet of things, wireless communication networks, and Internet access availability (Terrasson et al., 2017). Advances in engineering and biomaterials research, which have led to the miniaturization of electronic devices and decreased cost of electronics, have also been pivotal drivers for the diffusion of PLF (Neethirajan et al., 2017). PLF could provide farmers with continuous, non-intrusive, and objective data collection, able to detect small but significant changes in behavioral patterns or apparently unrelated parameters, which greatly improve farmers’ decision management (Frost et al., 1997). In pasture-based systems, this type of support for farmers is very important considering that farmer’s control on animals is less frequent. In the last decades, the PLF sector has rapidly evolved, from its earlier applications for electronic milk meters to novel wearable sensors and integrated systems capable of detecting an animal’s physiological and reproductive status with acceptable reliability through behavior analysis, rumination monitoring, and online real-time data harvesting (Halachmi et al., 2019). The information collected is elaborated and made available to end-users, enabling farmers to put in practice better management of one or more production inputs or to identify and intervene before the onset of clinical illness

(Andonovic et al., 2018). Currently, PLF is mainly developed for intensive farming systems, especially indoors, where farm structures and facilities are well suited for the needs of present digitisation (limited space, control of environmental conditions, easy access to electricity, and information and communication technologies). However, PLF could also be very useful in pasture-based systems, especially during seasonal grazing, when farmers' control of livestock can be difficult owing to the physical scale of pasture-based systems, variability, and density of the feed base and remoteness.

1.2 Statement of the Problem

A significant issue in livestock production arises from the local swine livestock farmers' lack of contemporary technology monitoring systems to assess the health and circumstances of the swine. It takes a long time to diagnose the condition of the animal because the majority of Filipino farmers lack the expertise necessary to distinguish between the various swine diseases.

1.3 Research Objectives

In this section, the researcher identified both the general and specific objectives.

1.3.1 General Objectives

The objective of this project is to create a knowledge-based piggeries system that will aid farmers in decision-making by providing them with timely recommendations.

1.3.2 Specific Objectives

Specifically, this study aims to:

- To provide better management practices for piggery livestock farming.
- To provide better animal welfare on piggery livestock farming.
- To help farmers in decision-making, reducing workload, and increasing profits.
- To ensure profitability, sustainability and protection of the environment in livestock farming.
- To ensure the animal's health welfare

1.4 Scope and Limitation

In this section, the developers elaborate the scope of the project which discusses the Whole coverage and boundaries of the project and then the limitation of the project which states the constraints of the application.

1.4.1 Scope of the Study

This study focuses only on piggery livestock farms on “location”(TBA).

1.4.2 Limitation of the Project

The purpose of this study is to collect data, analyze that data, and make recommendations for decision-making to help prevent potential diseases on the livestock in piggeries. It also seeks to present results to the user. The researcher is flexible enough to accommodate upcoming changes and system concepts. Additionally, the system might be able to adapt to the user's needs by broadening its knowledge depending on the data being gathered and changing how it works for itself.

- Able to gather daily data of the room temperature
- With the use of a weather forecast it provides additional information to provide an accurate recommendation for the future day.
- Able to store the data gathered in blood sampling.
- The technology will be able to display the gathered data in a visual format.
- Capable of displaying advice on disease prevention.
- The system will notify the end user in real-time about the weather forecast.

1.5 Significance of the Studies

The significance of the study is very timely for where technology is getting bigger and in demand. The proposed system will have a significant effect on both the farmers and the Researcher.

The importance of the studies is to help our community to be one of modern technologies and easy to maintain the condition in terms of the health and condition of the hogs/swine.

- **Piggery Livestock Farmers.** Easy to maintain the monitoring in terms of health and conditions for the pigs.
- **Researchers.** Their programming experience will be enhanced as a result of the project's success. The project will assist them in honing their programming skills and knowledge.
- **Future Researchers.** The study will serve as a starting point for them as they perform their own research.

REFERENCE

Livestock Research Division, DOST-PCAARRD S&T Media Service, (24 February 2016): Philippine pork to the world.

<http://www.pcaarrd.dost.gov.ph/home/portal/index.php/quick-information-dispatch/2681-philippine-pork-to-the-world?fbclid=IwAR08XY3EwpctqNYEkdX6PTqNKLXdYkSQtxIS9V3TzduSg6eJt75FDpo0Edw>

J.A. Calderón Díaz, J. Lee, S. Bueso Quan and H. Taheri. Azarpajouh was attached to Iowa State University, USA; author Calderón Díaz is attached to Teagasc, Ireland; the others are attached to Georgia Southern University, USA, (14-06-2021): Smart farming ideas for the swine industry.

<https://www.pigprogress.net/world-of-pigs/smart-farming-ideas-for-the-swine-industry/?fbclid=IwAR0juHLP3zYMCumXTm4IypMNIYqyFMrVyiPbyty6OrrZbQWX9kez6fJjVY>

Conceptualization, M.B.; Formal Analysis, M.B. and S.Y.; Investigation, M.B.; Writing—original draft preparation, M.B.; writing—review and editing, M.B. and S.Y.; Supervision, M.B, (2019 Mar 31): Precision Livestock Farming in Swine Welfare: A Review for Swine Practitioners.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6523486/?fbclid=IwAR2Kzs_Vzbse3HkARTDtPN0NH7uqAI7iNUuMCHF0g7ZUIYAQFPlrmt9SPdA

NJAS Volumes 90–91, December 2019,100311:Assessment of the value of information of precision livestock farming: A conceptual framework.

<https://www.sciencedirect.com/science/article/pii/S1573521418302215>

Philos Trans R Soc Lond B Biol Sci. 2009 Sep 27; 364(1530): 2643–2655.: The impacts of livestock diseases and their control on growth and development processes that are pro-poor.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2865091/>

C.Aquilani, A.ConfessoreR.BozziF.SirtoriC.Pugliese, Volume 16, Issue 1, January 2022, 100429: Review: Precision Livestock Farming technologies in pasture-based livestock systems.

<https://www.sciencedirect.com/science/article/pii/S1751731121002755>

B. Madonna, Michigan State University College of Veterinary Medicine and Marlo Macai Schneider, University of Western States - September 11, 2019 : Precision Livestock Farming Technology for Remote Monitoring of Pig Welfare and Health.

<https://www.canr.msu.edu/news/precision-livestock-farming-technology-for-remote-monitoring-of-pig-welfare-and-health>

A. Samaneh,C. Julia ,T. Diaz Hossein Taheri(07/01/2020):Application of precision livestock farming technologies in swine welfare management: What is possible today?

<https://porkgateway.org/resource/application-of-precision-livestock-farming-technologies-in-swine-welfare-management-what-is-possible-today/>

