

**DEVELOPMENT OF AN AI-BASED ELECTRONIC NOSE AND IMAGE  
PROCESSING TECHNIQUES FOR DETECTION OF *BOTCHA***

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## TABLE OF CONTENTS

	PAGE
LIST OF TABLES	ix
LIST OF FIGURES	x
LIST OF APPENDICES	xi
LIST OF APPENDIX TABLES	xii
LIST OF APPENDIX FIGURES	xiv
ABSTRACT	xv
INTRODUCTION	1
Background of Study	1
Statement of the Problem	3
Objectives of Study	5
Significance of Study	5
Scope and Limitation of Study	6
Time and Place of Study	7
REVIEW OF RELATED LITERATURE	8
Current Situation of the Swine Industry	8
Pork Meat Quality	11
Comparison of Fresh Pork Meat and Double-Dead Meat	11
Method to Detect the Quality of Pork Meat	12
Food Safety Control	13
National Meat Inspection System	13
Organoleptic Test	14
pH Value Test	15
Moisture Content	15
Microbial Test	17

## TABLE OF CONTENTS

	PAGE
Electronic Nose Sensor	18
Electronic Nose in Medical Field	19
Electronic Nose in Agricultural Products Detection	21
Machine Vision	25
Machine Vision in Medical Field	27
Machine Vision in Agricultural Products Detection	29
ImageJ Software	31
ImageJ Application	32
JASP Software	33
METHODOLOGY	35
Conceptualization of Study	35
Conceptual Framework	35
Flowchart of Activities	38
Sample Collections and Preparation	40
Experimental Setup	40
Electronic Nose Setup	41
Image Processing Setup	41
Data Acquisition	44
Electronic Nose Technique	44
Image Processing Technique	45

## TABLE OF CONTENTS

	PAGE
AI Model Building	47
Electronic Nose Technique	47
Image Processing Technique	48
Statistical Analysis	49
RESULTS AND DISCUSSION	50
SUMMARY, CONCLUSION AND RECOMMENDATION	67
LITERATURE CITED	71
APPENDICES	75

## LIST OF TABLES

TABLE		PAGE
1	Electronic nose technique generated models	47
2	Image processing technique generated models	48
3	Linear discriminant analysis classification efficiency using E-nose technique	51
4	Neural network classification efficiency using E-nose technique	52
5	Linear discriminant analysis classification efficiency using image processing	53
6	Neural network classification efficiency using image processing	54
7	Network weights for neural network of electronic nose technique	61
8	Network weights for neural network of image processing technique	63
9	Linear discriminant coefficients in electronic nose technique and image processing technique	65

## LIST OF FIGURES

FIGURE		PAGE
1	Number of pigs worldwide in 2022 by leading country	9
2	Volume and annual growth rate of hog production April 2020 to June 2022	10
3	Conceptual framework	37
4	Flowchart of the activities	39
5	Meat samples	40
6	Electronic nose setup	41
7	Image processing setup	42
8	Process flow of image processing, analysis and feature extraction	43
9	Flowchart of data acquisition process in E-nose technique	45
10	Flowchart of data acquisition process in image processing technique	46
11	A feed-forward back propagation neural network architecture of Model 11 of E-nose technique	58
12	A feed-forward back propagation neural network architecture of Model 3 of image processing technique	59
13	Logistic sigmoid neuron activation function from one of the combinations	60

## LIST OF APPENDICES

APPENDIX		PAGE
1	Tables	76
2	Figures	97
3	Methods for detecting <i>botcha</i> meat	100

## LIST OF APPENDIX TABLES

APPENDIX TABLE	PAGE	
1	RGB color values meat samples	76
2	Separation classification for performance testing of LDA and NN (mean RGB color values)	77
3	Separation classification for performance testing of LDA and NN (mode RGB color values)	80
4	Separation classification for performance testing of LDA and NN (green color values)	82
5	Linear discriminant analysis and neural network prediction efficiency	85
6	Neural network and linear discriminant analysis data for T-test	85
7	Prediction efficiency of neural network for image processing technique	85
8	Prediction efficiency of linear discriminant analysis for Image processing technique	86
9	ANOVA of linear discriminant analysis	87
10	Mean efficiency of the models	87
11	ANOVA of neural network	87
12	Mean efficiency of the models	87
13	Volatile compounds present in meat samples	88
14	Separation classification of vapor pressure and gas resistance for performance testing of LDA and NN	89

## LIST OF APPENDIX TABLES

APPENDIX TABLE		PAGE
15	Separation classification of vapor pressure and temperature for performance testing of LDA and NN	91
16	Separation classification of vapor pressure and humidity for performance testing of LDA and NN	93
17	T-test result of linear discriminant analysis and neural network of image processing	95
18	Mean efficiency of the models	95
19	ANOVA result of image processing and electronic nose technique using neural network	95
20	Mean efficiency of the detection techniques	95
21	ANOVA result of image processing and electronic nose technique using linear discriminant analysis	96
22	Mean efficiency of the detection techniques	96

## LIST OF APPENDIX FIGURES

APPENDIX FIGURE		PAGE
1	<i>Botcha</i> meat samples	97
2	Good meat samples	97
3	Electronic nose (BME688)	98
4	Data analysis using JASP software	98
5	Documentations	99

## ABSTRACT

**AUDENCIA, KING DAVID O., PAGANI, CLARIZZA JANE D.**, Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **JUNE 2023**, **DEVELOPMENT OF AN AI-BASED ELECTRONIC NOSE AND IMAGE PROCESSING TECHNIQUES FOR DETECTION OF *BOTCHA***

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The present investigation utilized artificial intelligence (AI)-based image processing and electronic nose sensing techniques to identify *botcha* meat. The findings of the investigation demonstrate the feasibility of detecting *botcha* through the utilization of two distinct techniques – the electronic nose technique and image processing technique.

The electronic nose technique relies on the specific presence of volatile compounds in *botcha* meat. Parameters such as vapor pressure, temperature, gas resistance, and relative humidity were extracted and analyzed. With these parameters various combinations were established. Moreover, the combinations of vapor vapor pressure and temperature, vapor vapor pressure and gas gas resistance, and vapor vapor pressure and relative humidity were observed to yield satisfactory results.

The image processing technique leverages the RGB color of meat. The mean of RGB color values, median of RGB color values and mode of RGB color values were extracted using ImageJ. The combinations of red mode value, blue mode value, and green mode value was found to be especially significant.

In the present study, an AI model was built using linear discriminant analysis and neural network classification to accurately evaluate the detection of *botcha*. However, it has been observed that there is no statistically significant distinction between the

performance of neural networks and linear discriminant analysis, so either of these analytical methods may be employed. There is no substantial distinction between electronic nose systems and methods of image analysis thus, e-nose and image processing technique can be utilized for the purpose of accurately detecting *botcha* meat.

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