

Sirapote Santatiwut 2011: Model for Avian Influenza Surveillance of Poultry Husbandary in Thailand Using Data Mining. Master of Science (Computer Science), Major Field: Computer Science, Department of Computer Science. Thesis Advisor: Associate Professor Anongnart Srivihok, Ph.D. 218 pages.

Avian Influenza namely, Bird Flu, is a virulent virus which destroys poultries severely and some harmful to human. It has threatened Thailand economics since there are many Thai people who are live stock farmers and earn their living by poultry productions. In the past researchers proposed the models, procedures and techniques to predict and prevent Avian Influenza epidemic. This present study proposes a classification model for predicting the characteristics of poultry farms in Thailand that having high risks of Avian Influenza epidemic. This proposed model is built by Data Mining Techniques.

In this research, data were undertaken from reports of death and ill poultries from the Department of Livestocks, Ministry of Agriculture in period 2004 - 2007 and Weather Information Metheology Department of the same periods. There are totally 8,152 records of death and ill poultries. Data set included 1) Death and ill poultry from Avian Influenza was 1,351 records and 2) death and ill poultry from other reasons was 6,801 records. The experiments included three steps. First step, data from the above two sources were combined and preprocessed. Then, discretization, attribute selection and weighting data by two different methods were applied. The first weighting method was Decision Making Trial and Evaluation Laboratory (DEMATEL) and the second method, instance weights were computed from Emerging Pattern (EP) algorithm. Second step, classification models were generated by using Data Mining techniques: Bayesian Network, Decision Tree and Naive Bayes Tree. Classification Performances of each Model were evaluated by using accuracy rate, precision value recall value and F-measure value.

Results of this study showed that the model built from Bayesian Network using discretized data set, selected attributes, and weighting data computed from Emerging Pattern had the highest performance with 95.98 % accuracy, and precision (0.943) and Recall (0.939). Further, factors which contribute to the epidemric of Bird Flu in poultry farms were proposed. They included (1) month of death, (2) humidity, (3) day light hours, (4) Temperature, (5) height, (6) landscape, (7) number of dead poultries and (8) number of destroyed poultry. Lastly, the production rules which concerning the Bird Flu epidermics were presented.

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