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APPLICATION OF ARTIFICIAL NEURAL NETWORK ON MEAT QUALITY: SHORT REVIEW

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ABSTRACT

Artificial neural network (ANN) is complicated computational systems mainly act based on biological neural system. The viewpoint of restriction in solving physical models in phenomenon of food stuffs is the majority of ANN application in modeling of physical reaction of foodstuffs, additionally ANN demands as an advanced data treatment approach not only in modeling but also in inspection stages of food processing and final products. Ever since meat and meat products undergo chemical reactions to become spoiled, ANN may consider as a new method in such a way of inspecting and forecasting quality of food materials.

KEY WORDS

Artificial Neural Network, Modeling, Meat, Meat products.

Today's lack of a nondestructive method with no environmental hazards, and lower risk of human error has been led to a drawback to reach to a method which considers to be able covering all the mentioned parameters. There are several promising tested methods available which includes NIR (Near infrared), FT-IR (Fourier transformed infrared) spectroscopy, biosensors and so forth. However obtained results from all of all of methods requested to be analyzed demanding an advanced data treatment approach. Artificial neural network (ANN) as well-reputation mathematical tool widely used to investigate problems in meat industries. Its highlighted ability in potential of identification problems comes from its handling with nonlinear data and being highly correlated. This article shortly reviews the promising application of ANN in meat sector.

Application of Artificial Neural Networks. ANN mechanism evolves from the idea of simulating human brain [10, 11]. Regarding its initial unpromising algorithm, ANN enhanced into a strengthened computational method where detection of behavior among complex data made possible. Well explained data set with an appropriate mathematical models unlikely required ANN method of analysis.

Feed-forward neural network. This type of network is the first developed technique of ANN where information moves only in one direction, forwarded from the input neurons to the output nodes with no cycle and loop. Perceptron is the simplest kind of it. Back propagation learning consists of supervised algorithm with ability of correcting the weights within each layers of neurons in proportion to the error of preceding layer level.

Kohonen neural networks. Human's brain contains of some neighborhood neurons curtained specialized to store information and thus this part of brain has basically used to develop Kohonen ANN which mimics human brain functioning i.e., this type of ANN applied unsupervised learning strategy (independent variables for the input vectors) are needed.

Counter-propagation (CP-ANN). CP-ANN categorizes into stages; kohonen layer (unsupervised with mapping of object) and supervised learning base step where response or target value required.

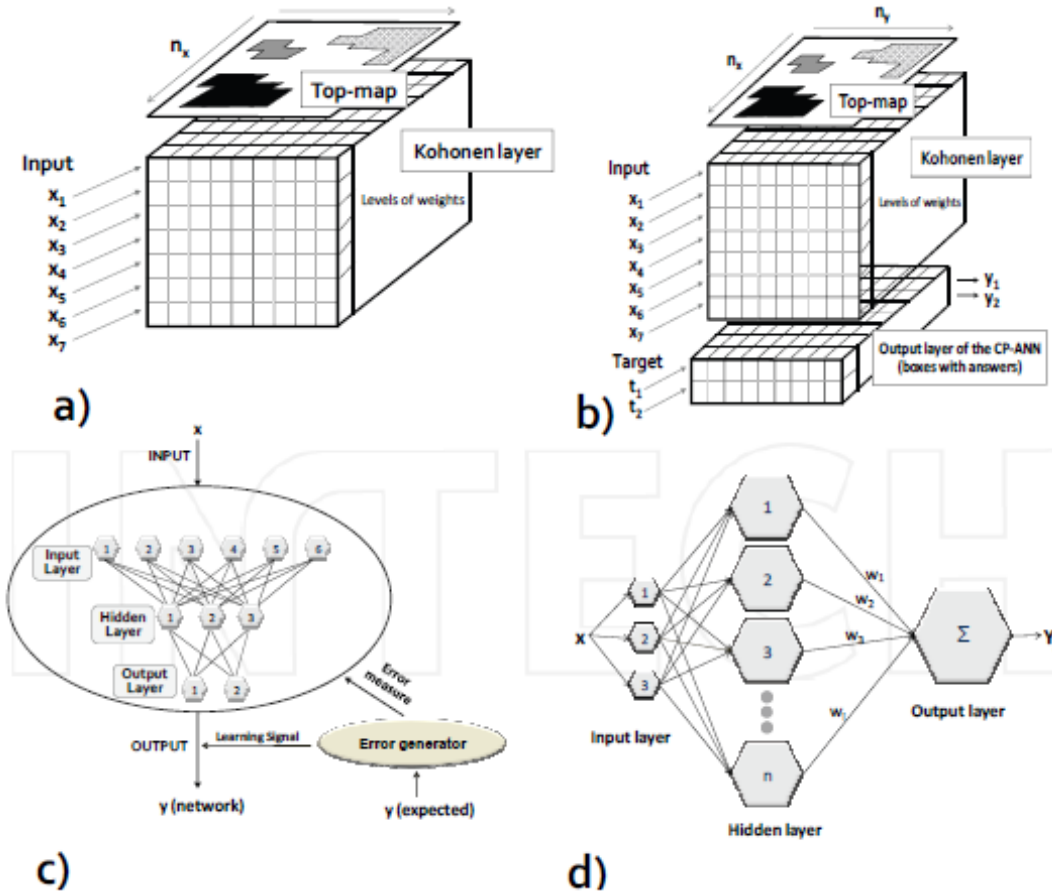


Figure 1 - The structure of the a) Kohonen ANN, b) CP-ANN, c) BP-ANN and d) RBF network [9]

From the viewpoint and accordingly consumers' standpoints differ and refers to the lean meat content on which payment to the farmer is based. In the last decade emerging of novel technology such as computer vision, spectral imaging, spectroscopy, and etc have developed to upgrade inspection methods of foodstuffs.

Application of ANN in meat quality evaluation and meat chemical. Artificial Neural Network applied to evaluation meat properties (mainly subjective) as follows: tenderness [5]; color [1,6]; marbling score/level [3]; dealing with water-holding capacity of pork [9]; investigation of spoilage [4, 8]; fat [7]; volatile compounds [2].

Conclusion. The existing research work of ANN applications in food industry, although have not completely encountered in literature review is in association with novel technology. The potential interests relevance of ANN is its being useful in meat quality inspection as well as quality prognostication based on information from rearing phase.

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