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## ARTIFICIAL NEURAL NETWORK FOR PREDICTING NUTRIENTS CONCENTRATION IN RUNOFF FROM BEEF CATTLE FEEDLOT

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### Abstract

Nutrient runoff is an environmental concern. There is a need for a robust method of predicting nutrient concentrations in runoff from feedlots to facilitate management practices. To investigate the feasibility of using multiple linear regression (MLR) and artificial neural network (ANN) in predicting nutrients in runoff, simple water quality parameters (e.g., pH and EC) of runoff from a feedlot in North Dakota, USA, were used to train an ANN. Both models accurately predicted potassium concentration based on inputs pH and electrical conductivity (EC). The ANN approach, however, used in this study gave a better prediction than multiple linear regression models. It may be concluded that ANN may be a useful tool for predicting nutrients concentration in runoff using pH and EC, when expensive and time-consuming analytical data are not available, and this information may be used for implementing measures to minimize environmental concerns.

*Key words:* Artificial neural network (ANN), EC, feedlot runoff, multiple linear regression (MLR), pH

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