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Early warning modeling and analysis based on a deep radial basis function neural network integrating an analytic hierarchy process: A case study for food safety

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1 Early warning modeling and analysis based on a deep radial basis function neural
2 network integrating an analytic hierarchy process: A case study for food safety

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9 **Abstract:** Food safety is vital to the national economy and livelihood of people.
10 Therefore, effective food safety warnings are helpful to the healthy and sustainable
11 development of society. Focused on the early warning modeling for a certain scale of
12 complex food safety inspection data, this paper proposes a novel early warning
13 modeling method based on the deep radial basis function (DRBF) neural network that
14 integrates an analytic hierarchy process (AHP). First, the AHP based on the entropy
15 weight is used to obtain the risk fusion results of the inspection data as the expected
16 output of the DRBF. Then, the DRBF model based on the autoencoder is used to
17 build the early warning model, implementing feature learning to acquire the high-
18 level representation of the food inspection data. Finally, the category data of sterilized
19 milk from the food safety inspection data of a province in China is taken as a case
20 study. Comparing the experimental results of the radial basis function (RBF) neural

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