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Portable electronic nose applied to determination of contaminants in milk

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Milk is one of the most consumed food in the world and one of the most likely to suffer adulteration by adding water or even chemical substances which represents a serious risk to consumer health, due to this the development of more effective tools for the analysis of milk has been the subject of constant studies. Among the characteristics of milk, the aroma is one of the most important and can say much about the quality of the product. The electronic nose has demonstrated to be a promising tool for the analysis of flavorings and similar to human olfaction, it uses an array of chemical sensors with partial selectivity associated with pattern recognition powerful techniques, among them the artificial neural networks have shown satisfactory performance and efficiency, being the most used for discrimination of aromatic profiles. This paper presents the performance of a portable electronic nose designed for the quality evaluation of milk when it is subjected to adulteration by chemicals such as formaldehyde, sodium hydroxide and urea, the differential of this device compared to hallowed techniques of physicochemical analysis is the possibility of obtaining real-time response and adds portability, low cost and simple interface. For two months, we analyzed five commercial brands of milk and from these, samples were separated containing different proportions of the contaminants cited, altogether 40 samples were analyzed. For the recognition and classification of each contaminant, we use a neural network multilayer perceptron, in addition, other techniques facilitated the development of neural network such as the bootstrap resample used to create a network training data set from the original samples, network parameters were adjusted using sequential simplex optimization and the reliability of the results was analyzed through statistic tools. The neural network showed satisfactory performance recognizing all contaminants from the set of test samples constituted only by the original samples, samples used for training obtained from the bootstrap, 95% were correctly classified as 97% of validation samples, and this demonstrates that the network is able to identify the aromatic profile of each contaminant. The advantage observed by the incorporation of artificial neural networks to the electronic nose is the possibility to circumvent the effects of noisy signals and interferences which the electrical measurements are subject. This is the first time that the electronic nose is applied to discrimination milk when subjected to adulteration by various types of contaminants which makes it an innovative tool for the dairy industry.

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Establish halal market access, New Zealand an example

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New Zealand is the largest exporter of lamb and beef in the world and accounting for around 47% of the world's trade in lamb. The New Zealand meat sector has always been a principal driver of the New Zealand economy system, generating approximately $7.5 billion annually in export earnings. The halal meat grade is playing an increasing role in meat production in New Zealand. New Zealand has been exporting halal meat since 1970s for the most part with little government involvement. For the last five years, there has been government oversight of halal processing through the halal notice administered by ministry of primary industry (MPI). This oversight provides overseas regulators and customers with additional assurances about the integrity of New Zealand's halal processing systems. During the year MPI undertook consultation on proposed changes to the halal notice to ensure that it remains fit for purpose. In addition, the meat industry association supported of a collaborative and consultative approach to resolving halal-related issues and would particularly like to see the notice provide a robust mechanism to provide all those involved in halal processing with independent, timely advice when questions on specific halal requirements are raised. Now a days, New Zealand exports halal certified meat to around 75 countries. Back in the 1970s, halal slaughter men had to be Muslim, but they did not need qualifications. After all, the practice of halal slaughter has been largely the same and enshrined in sharia (Islamic law) for hundreds of years. But today, halal slaughter men in New Zealand must be trained to New Zealand Qualifications Authority (NZQA) standards, and the companies that export halal meat. The market of halal products is widely distributed throughout the world. New Zealand will, in the future, promote and market its livestock products on the basis of quality and position itself at the top of halal export countries. The industry will think more in terms of quality and fit for purpose and halalness of products is a major part of it.

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