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PREDICTION OF THE TYPE OF MILK AND DEGREE OF RIPENING IN CHEESES BY MEANS OF ARTIFICIAL NEURAL NETWORKS WITH DATA CONCERNING FATTY ACIDS AND NEAR INFRARED SPECTROSCOPY.

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Abstract

The present study addresses the prediction of the time of ripening and type of mixtures of milk (cow's ewe's and goat's) in cheeses of varying composition using artificial neural networks (ANN). To accomplish this aim, neural networks were designed using as input data the content of 19 fatty acids obtained with GC-FID of the cheese fat and scores obtained from principal component analysis (PCA) of NIR spectra. The best model of neuronal networks for the identification of the type of mixtures of milk was obtained using the information concerning the fatty acid concentration (80% of correct results in the training phase and 75% in validation phase). Regarding the information of the near-infrared (NIR) spectra a neural network was designed. The aforesaid neural network predicted the ripening of cheeses with 100% accuracy in both training and in validation.

Keywords: Cheese, Classification, fatty acid, NIR spectroscopy, artificial neuronal networks, ripening time.

1. Introduction

Cheese is currently one of the most widely consumed milk derivatives and is the one affected by the highest number of factors. The nutrient values of cheeses and their technological characteristics, such as the composition of the different fatty acids, are affected by numerous factors such as breed [1], season[2-4], stage of lactation [5-7], and diet[8-11]. Moreover, regarding diet, the geographical origin of the milk may have an influence due to seasonal

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