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(P3) A study of seasonal variation in composition of raw milk from British farms

N Salman, Martin Howarth and Hongwei Zhang

Sheffield Hallam University, UK

The composition of raw milk is of great interest to UK dairy product industry as milk with particular chemical composition can be specifically used for certain products. Milk composition varies due factors such as diet, lactation stage, age of the cow and genetics.

In this study, the composition of raw milk supplied to a milk powder production factory is studied over a period of one year. Principle component analysis (PCA) has been performed on the composition of raw milk from number British farms. The data includes scanning measurements of raw milk composition, process parameter measurements and quality assessment data of milk powder from a local factory.

The variation of the protein percentage was found to be lower than expected with a variance of 0.0177; the variance of the raw milk fat content is 0.0633 while the total solids showed a higher variance of 0.1237. Although no significant correlation was found between the milk fat and protein, there was considerable correlation between milk fat and total solids. Interesting trends were discovered in the raw milk data, especially the milk fat content, where higher levels of milk fat was observed in the winter season compared to the summer. It was observed that the protein levels are high in the autumn months (Sept-Oct), lower in the winter months and intermediate over the summer period. PCA is performed on both the covariance and correlation matrix of the observed data.