

MULTIVARIATE STATISTICAL VISUALIZATION AND MCDONALDS NUTRITIONAL INFORMATION: CHOOSE YOUR MEAL

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MOTIVATION

The food nutritional information have nowadays a strong importance, people are looking for healthy options of meal. In spite of different kind of meals (some more energetic, some less), to choose a meal that would be really complete is not so easy. The research about nutritional variables over common fast-food meals can be exemplified by the work of Mock et al. (1997) and Rolls et al. (2004). The McDonalds restaurants in Brazil started to show the nutritional table of meals in 2002, through the Internet website and in the paper tray. This dataset have 10 nutritional variables for each meal components, distributed in some classes (meals, beverage, desserts etc). However, the joint interpretation of all nutritional variables seems to be complex or even impossible, just looking the data table. Multivariate statistical visualization can be an alternative to show the relationship between these variables and each meal component.

The objectives of this work are (i) to spread the utility of this dataset as motivating way to teach Multivariate Analysis, once it is near to students eating behavior and has moderate complexity to test the multivariate techniques; (ii) to compare different multivariate visualization techniques, as cluster analysis, Biplot diagram and factor analysis; (iii) to propose a graphical summary about the different meals and the human nutrition needs.

METHODOLOGY AND EXPECTED RESULTS

It is not possible to show more than three variables in a plain page as they are presented, what claims some kind of summary. The Multivariate Statistical Analysis is an area that offers many ways to summarize and to show multidimensional data. Some simple visual methods are the Draftsmán's display, Chernoff faces and Andrew's Fourier plots (Manly, 1994). Most sophisticated but readily computer available techniques may be used previously to generate summary two-dimensional data, as cluster and factor analysis, multidimensional scaling and Biplot diagrams (Wichern & Johnson, 2002).

Multivariate diagrams will be presented using the same dataset, showing the different characteristic of each technique and how they help to explain the complex dimensionality of the nutritional dataset in an easy way, helping to choose the best meal.

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REFERENCES

- Mock, J., Adams, A., Snowdon, L. & Griffiths, H. (1997) Nutritional analysis of mid-day meals provided for 5-11 year-old schoolchildren. *British Food Journal*, 99, 1. (pp. 12-19). England: MCB University Press.
- Rolls, B.J., Roe, L.S., Meengs, J.S. & Wall, D.E. (2004) Increasing the portion size of a sandwich increases energy intake. *J. Am. Diet. Assoc*, 104, 3. (pp. 367-372). USA: American Dietary Association.
- Manly, B.F. (1994) *Multivariate Statistical Methods: A primer*. London: Chapman & Hall.
- Wichern, D.W. & Johnson, R.A. (2002) *Multivariate Statistical Analysis*. London: Prentice-Hall.