Irish Section Meeting, 20–22 June 2018, Targeted approaches to tackling current nutritional issues

Developing a method to create a digital food atlas for use in Nutritics professional nutrition analysis software

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Inaccurate estimation of portion size is a common source of error in the analysis of dietary intake[1]. However, using a food atlas is a useful tool to support improved portion size estimation[2]. Nutritics, a commonly used dietary analysis tool, hosts 230,000 foods from 295 food composition databases with portion size information available for most foods. However, within the tool limited digital food portion size photos exist. Therefore, the aim of this study was to develop a food photography protocol for the development of a digital food atlas to be used within Nutritics software.

The five most frequently used food databases were interrogated using structured query language (SQL) code to produce a dataset of foods identified by food code and matched to applicable portion size information. Foods were grouped by food category and the portion size information was grouped by description, then measure. A manual gap analysis was completed to identify foods with portion information but no portion photo. A procedure was developed to define photography criteria in line with protocols published by similar studies[3]. Standardised photo templates for a plate, bowl and glass were developed. Foods were purchased and prepared according to portion size measure and description. Photos of food portions were taken according to the procedure using A DSLR (Canon EOS kiss X4) camera with an 18–55 mm lens. EOS utility software was used to remotely operate the camera from a laptop using a USB cable. This facilitated the alignment of food portion photos with the standard photo template. Adobe Photoshop CS6 was used to design and edit the final image.

Fig. 1. Portion photos, apples with skin, raw, small 120 g, medium 174 g, large 230 g.

21201 foods from 5 databases were interrogated and of these 5755 foods were returned as having portion information. These foods were grouped into 96 unique food categories. A total of 10325 measures and descriptions were associated with the 5755 foods. Of those, 490 foods had 5 portion sizes, 423 foods had 4 portions, 832 foods had 3 portions, 1078 had 2 portions and 1531 foods had 1 portion measure. Of the 5755 food types with portion sizes 1684 foods were already populated with portion photos. In total, 705 photographs were taken and added to the Nutritics digital food atlas. The photos were taken at 47° angle, from a distance of 95 cm and height of 70cms, using a customised soft box for lighting and background, on white crockery with cutlery fiducial markers (knife fork spoon) as shown in the figure.

In conclusion, this study developed a standard method for the creation of a digital food atlas. A digital food atlas has the potential to act as a portion size estimation aid which may improve both applied and population based nutrition research.

1. Gibney M *et al.* (2009) *Introduction to human nutrition.* 2nd ed, West Sussex: Wiley-Blackwell.
2. Turconi G, Guarcello M, Berzolari FG *et al.* (2005) *Eur J Clin Nutr* **59**, 923–931.
3. Bouchoucha M, Akrout M, Bellali H, *et al.* (2016) *Libyan J Med* **11**, 32676.