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*Published in:*  
British Journal of Nutrition

*DOI:*  
[10.1017/S0007114514003602](https://doi.org/10.1017/S0007114514003602)

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*Recommended citation(APA):*  
Gemming, L., Rush, E., Maddison, R., Doherty, A., Gant, N., Utter, J., & Ni Mhurchu, C. (2015). Wearable cameras can reduce dietary under-reporting: doubly labelled water validation of a camera-assisted 24 h recall. *British Journal of Nutrition*, 113(2), 284-291. <https://doi.org/10.1017/S0007114514003602>

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## Wearable cameras can reduce dietary under-reporting: doubly labelled water validation of a camera-assisted 24 h recall

British Journal of Nutrition, Volume 113, Issue 2

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DOI: 10.1017/S0007114514003602

Published online: 28 November 2014, pp. 284-291

Print publication: January 2015

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### Summary

Preliminary research has suggested that wearable cameras may reduce under-reporting of energy intake (EI) in self-reported dietary assessment. The aim of the present study was to test the validity of a wearable camera-assisted 24 h dietary recall against the doubly labelled water (DLW) technique. Total energy expenditure (TEE) was assessed over 15 d using the DLW protocol among forty adults ( $n$  20 males, age 35 (SD 17) years, BMI 27 (SD 4) kg/m<sup>2</sup> and  $n$  20 females, age 28 (SD 7) years, BMI 22 (SD 2) kg/m<sup>2</sup>). EI was assessed using three multiple-pass 24 h dietary recalls (MP24) on days 2–4, 8–10 and 13–15. On the days before each nutrition assessment, participants wore an automated wearable camera (SenseCam (SC)) in free-living conditions. The wearable camera images were viewed by the participants following the completion of the dietary recall, and their changes in self-reported intakes were recorded (MP24+SC). TEE and EI assessed by the MP24 and MP24+SC methods were compared. Among men, the MP24 and MP24+SC measures underestimated TEE by 17 and 9 %, respectively ( $PP= 0.02$ ). Among women, these measures underestimated TEE by 13 and 7 %, respectively ( $PP= 0.004$ ). The assistance of the wearable camera (MP24+SC) reduced the magnitude of under-reporting by 8 % for men and 6 % for women compared with the MP24 alone ( $PP$

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