

Editorial

BJN impact factor rises

On 19 June 2009, the Institute for Scientific Information (ISI) released its annual statistics on citations of articles published in previous years in scientific journals. A number of different summary statistics are produced by the ISI, the most widely discussed being the impact factor. I have used previous editorials to keep readers informed of the most recent statistics for the *British Journal of Nutrition (BJN)* and to analyse them in relation to those of comparator journals and to temporal changes^(1–4). The *BJN* is listed in the Nutrition and Dietetics category of ISI Journal Citation Reports[®]. In 2008 there were fifty-nine journals listed in this category, including review journals and journals in the areas of obesity (for example, *International Journal of Obesity, Obesity*) and lipidology (for example, *Progress in Lipid Research, Lipids*). The impact factor of a journal is calculated as the number of citations of papers published in the previous 2 years divided by the number of papers published in those 2 years. Thus, the impact factor for 2008 (issued in 2009) is based upon the number of citations during 2008 of papers published in a particular journal in 2006 and 2007 divided by the number of papers published in that journal in 2006 and 2007. Clearly, this favours very rapidly moving areas of research. Hence journals such as *Nature, Science* and *Cell* have high impact factors (31.43, 28.10 and 31.25, respectively, for 2008). For the past 7 years, the two highest ranked journals in the Nutrition and Dietetics category have been *Progress in Lipid Research* and *Annual Reviews in Nutrition*, with impact factors of 11.23 and 8.20, respectively, for 2008. Table 1 lists the impact factors for the *BJN* and nine comparator journals over the period from 2001 to 2008 inclusive. The comparator journals all publish a similar range of material as does the *BJN*, including molecular, cellular, whole body, human, clinical, public health and experimental animal nutrition and, in most cases, also farm animal nutrition. It is evident that the *American Journal of Clinical Nutrition* is firmly established as the highest-ranked journal in this category that is not solely limited to publishing review articles. In 2008, the impact factor of the *BJN* rose from 2.34 to 2.76 (1827 of citations in 2008 to the 661 articles published in 2006 and 2007); I take this as an indication of the health of the journal. However, to indicate the fickle nature of impact factor, I have calculated that if each paper published in the *BJN* in 2006 and 2007 had been cited just once more than it actually was, the impact factor would have been 3.76! Readers may be interested in the impact factors of our sister journals. For 2008 these were 3.98, 2.12 and 1.66 for *Proceedings of the Nutrition Society* (ranked 6/59), *Public Health Nutrition* (27/59) and *Nutrition Research Reviews* (33/59), respectively.

Table 2 lists the articles published in the *BJN* during 2006 and 2007 that were most highly cited in 2008^(5–19). This Table

indicates the importance of review articles and the *Horizons in Nutritional Science* series to the impact factor of the journal. Although the articles published in 2006 continue to be cited (Table 2), they will not contribute to the impact factor for 2009 which will be based upon articles published in 2007 and 2008.

One argument against the importance of impact factor in indicating the 'value' of a journal is that the time frame over which it is calculated is too short to really reflect the impact that the articles that a journal publishes will have. Thus, alternative measures of article citations are available. These include the total number of citations made to articles published in a journal, the 5-year impact factor, and the cited half-life of articles. Table 3 lists the total number of citations made to articles published in the *BJN*, irrespective of their year of publication, during the years 2000 to 2008. In 2008 articles published in the *BJN* were cited 11 287 times, placing the *BJN* fifth in the Nutrition and Dietetics category for total citations in 2008. It is apparent that the total number of citations of articles in the journal has increased year-on-year and increased by 15 % from 2007 and by over 100 % since 2000. The cited half-life of a journal (Table 3) is the median age of the articles published in that journal that are cited in the reporting year. Thus, publication of articles that remain important (or controversial) long after they are published will result in a long cited half-life. For 2008 *Nature, Cell* and *Science* have cited half-lives of 8.5, 8.8 and 8.4 years, respectively. Thus, these journals are publishing articles that are seen as important in the short term, as judged by their high impact factor, but which remain important for many years after publication, as judged by the cited half-life. There may, of course, be other influences on cited half-life. For example, publication of articles of little interest by a journal that in the past has published articles that still remain of interest will result in a long cited half-life. The cited half-life of the *BJN* for 2008 was 7.1 years, indicating that half of the citations to articles to *BJN* in 2008 were to articles published in 2001 or before. Thus, it seems to me that the *BJN* is publishing articles that are seen as important in the short term, as judged by the reasonably high impact factor (within the journal category), but which remain important for many years, as judged by the cited half-life. For comparison, the cited half-lives for the *American Journal of Clinical Nutrition* and the *Journal of Nutrition* for 2008 were 8.0 and 6.9 years, respectively. The immediacy index is calculated as citations of articles published in the reporting year (for example, 2008) by papers published in that same year. It is a measure of how immediately important (or controversial) published papers are. For 2008, the immediacy index of the *BJN* was 0.602 (212 citations in 2008

Table 1. Impact factor of the *British Journal of Nutrition* and comparator journals over the period 2001–8*

	Impact factor and ranking†							
	2001	2002	2003	2004	2005	2006	2007	2008
<i>American Journal of Clinical Nutrition</i>	5.02 (2/50)*	5.60 (3/50)	5.69 (3/53)	5.43 (3/53)	5.85 (3/53)	6.56 (3/55)	6.60 (3/56)	6.74 (3/59)
<i>Journal of Nutrition</i>	3.25 (5/50)	3.62 (4/50)	3.32 (5/53)	3.25 (7/53)	3.69 (7/53)	4.01 (5/55)	3.77 (7/56)	3.65 (8/59)
<i>Clinical Nutrition</i>	2.46 (9/50)	1.55 (22/50)	1.19 (32/53)	2.02 (18/53)	2.29 (15/53)	2.47 (15/55)	2.88 (14/56)	3.20 (12/59)
<i>British Journal of Nutrition</i>	1.99 (16/50)	2.49 (7/50)	2.62 (9/53)	2.71 (10/53)	2.97 (9/53)	2.71 (12/55)	2.34 (17/56)	2.76 (15/59)
<i>European Journal of Clinical Nutrition</i>	1.77 (20/50)	1.94 (18/50)	1.86 (19/53)	2.13 (16/53)	2.16 (18/53)	2.12 (22/55)	2.33 (18/56)	2.69 (18/59)
<i>Nutrition</i>	1.43 (23/50)	2.27 (10/50)	2.32 (11/53)	1.96 (19/53)	2.06 (20/53)	2.23 (20/55)	2.10 (21/56)	2.28 (23/59)
<i>Journal of the American College of Nutrition</i>	1.53 (22/50)	2.17 (11/50)	2.98 (7/53)	2.80 (9/53)	2.21 (17/53)	2.45 (16/55)	2.28 (19/56)	2.16 (25/59)
<i>European Journal of Nutrition</i>	2.13 (13/50)	1.64 (21/50)	1.68 (22/53)	2.09 (17/53)	2.26 (16/53)	2.36 (18/55)	2.09 (23/56)	1.89 (29/59)
<i>Annals of Nutrition and Metabolism</i>	1.01 (31/51)	1.08 (28/50)	1.81 (20/53)	1.07 (35/53)	1.56 (29/53)	1.62 (30/55)	1.83 (28/56)	1.24 (40/59)
<i>Nutrition Research</i>	0.60 (37/50)	0.79 (35/50)	0.72 (39/53)	0.57 (41/53)	0.77 (40/53)	0.73 (44/55)	0.68 (51/56)	0.87 (48/56)

* Data are from Institute for Scientific Information Journal Citation Reports®.

† Ranking amongst journals in the Nutrition and Dietetics subject category is shown in parentheses underneath each impact factor (for example, *British Journal of Nutrition* ranked seventh out of fifty journals in 2002).

of 352 articles published in 2008). For comparison, the immediacy indexes for the *American Journal of Clinical Nutrition* and the *Journal of Nutrition* for 2008 were 1.083 and 2.07, respectively. In 2008 the 5-year impact factor was calculated for the first time; this is the number of citations in the year to articles published in the previous 5 years. For 2008, the 5-year impact factor of the *BJN* was 3.233 (4530 citations in 2008 to articles published in 2003 to 2007 inclusive), placing it fourteenth in the Nutrition and Dietetics category. For comparison, 5-year impact factors for the *American Journal of Clinical Nutrition* and the *Journal of Nutrition* for 2008 were 7.679 and 4.306, respectively. The final statistic shown in Table 3 is the Eigenfactor™ score. This is a complex calculation, which, like impact factor, is a ratio of the number of citations to the total number of articles published. However, unlike the impact factor, the Eigenfactor™ score counts citations to journals in both the sciences and social sciences, eliminates self-citations (i.e. every reference from one article in a journal to another article from the same

journal is discounted) and weights each reference according to a stochastic measure of the amount of time researchers spend reading the journal⁽²⁰⁾. For 2008, the Eigenfactor™ score of the *BJN* was 0.02741, placing it fifth in the Nutrition and Dietetics category for 2008. For comparison, Eigenfactor™ scores for the *American Journal of Clinical Nutrition* and the *Journal of Nutrition* for 2008 were 0.09491 and 0.07115, respectively.

Another relatively new statistic is the Article Influence™ score, which calculates the relative importance of the journal on a per-article basis. It is the journal's Eigenfactor™ score divided by the fraction of articles within the category published by that journal. That fraction is normalised so that the mean Article Influence™ score within the category is 1.00. A score greater than 1.00 indicates that each article in the journal has above-average influence, while a score less than 1.00 indicates that each article in the journal has below-average influence. For 2008, the Article Influence™ score of the *BJN* was 0.883, placing it twelfth in the Nutrition and Dietetics category. For comparison, Article Influence™ scores for the

Table 2. Articles published in *British Journal of Nutrition* in 2006 and 2007 that were most highly cited in 2008*

	Type of article	Citations in 2008	Total citations to date
Burdge <i>et al.</i> (2007) ⁽⁵⁾	Full paper	18	30
Koletzko <i>et al.</i> (2007) ⁽⁶⁾	Consensus statement	17	28
Roe <i>et al.</i> (2007) ⁽⁷⁾	Review	17	26
Calder <i>et al.</i> (2006) ⁽⁸⁾	Workshop report	16	30
Lillycrop <i>et al.</i> (2007) ⁽⁹⁾	Full paper	16	28
Gil-Campos <i>et al.</i> (2006) ⁽¹⁰⁾	Review	15	27
Mullen <i>et al.</i> (2006) ⁽¹¹⁾	Full paper	14	27
Burdge <i>et al.</i> (2007) ⁽¹²⁾	Horizons	13	23
Thijssen <i>et al.</i> (2006) ⁽¹³⁾	Full paper	13	18
Li <i>et al.</i> (2007) ⁽¹⁴⁾	Review	11	26
Salvini <i>et al.</i> (2006) ⁽¹⁵⁾	Full paper	11	19
Golan <i>et al.</i> (2006) ⁽¹⁶⁾	Full paper	11	17
Kamphuis <i>et al.</i> (2006) ⁽¹⁷⁾	Systematic review	10	18
Arnaud <i>et al.</i> (2006) ⁽¹⁸⁾	Full paper	10	17
Goyenechea <i>et al.</i> (2006) ⁽¹⁹⁾	Full paper	10	16

* Data were obtained from Institute for Scientific Information Web of Science® on 23 June 2009.

Table 3. Citation statistics for the *British Journal of Nutrition* 2000–8

	2000	2001	2002	2003	2004	2005	2006	2007	2008
Impact factor	2.415	1.989	2.491	2.616	2.710	2.967	2.708	2.339	2.764
Total citations	5515	5360	6205	7144	7204	7893	8665	9843	11287
Cited half-life (years)	>10.0	8.9	8.0	7.7	7.0	6.3	6.8	7.1	7.1
5-year impact factor	–	–	–	–	–	–	–	3.13	3.23
Immediacy index	0.307	0.283	0.402	0.500	0.515	0.289	0.300	0.337	0.602
Eigenfactor™ score ⁽²⁰⁾	–	–	–	–	–	–	–	0.02486	0.02741

American Journal of Clinical Nutrition and the *Journal of Nutrition* for 2008 were 2.246 and 1.189, respectively.

My overall view based upon these statistics is that the *BJN* is doing well, but could do better. As I indicated in my previous editorials^(2–4), the *BJN* is receiving more submissions and is publishing more articles than ever before. This suggests that the journal is in very good health and is viewed favourably by researchers within the discipline. The communications that I receive indicate that authors want to publish their work in the *BJN*. My aim is to act to improve the impact factor, the 5-year impact factor and the Article Influence™ score in order that the prestige and attractiveness of the *BJN* are maintained in the face of mounting competition from other journals, and that its perceived quality is enhanced. This will require a more stringent set of criteria for acceptance of papers and will undoubtedly be unpopular with some authors. However, an improvement in (perceived) quality of the *BJN* will assure its place amongst the top journals in the field and as Editor-in-Chief it is my role to strive for this.

Philip C. Calder
 Editor-in-Chief
 Institute of Human Nutrition
 School of Medicine
 University of Southampton
 Southampton
 UK

email pcc@soton.ac.uk

doi:10.1017/S0007114509991619

References

- Calder PC (2006) Carpe diem. *Br J Nutr* **95**, 1–4.
- Calder PC (2007) Floruit floreat. *Br J Nutr* **97**, 1–3.
- Calder PC (2007) Happy Birthday *BJN*! *Br J Nutr* **98**, 447–450.
- Calder PC (2008) Record citations in 2007, but impact factor slips. *Br J Nutr* **100**, 687–689.
- Burdge GC, Slater-Jefferies J, Torrens C, *et al.* (2007) Dietary protein restriction of pregnant rats in the F0 generation induces altered methylation of hepatic gene promoters in the adult male offspring in the F1 and F2 generations. *Br J Nutr* **97**, 435–439.
- Koletzko B, Cetin I, Brenna JT & for the Perinatal Lipid Intake Working Group (2007) Dietary fat intakes for pregnant and lactating women. *Br J Nutr* **98**, 873–877.
- Roe MA, Spinks C, Heath AL, *et al.* (2007) Serum prohepcidin concentration: no association with iron absorption in healthy men; and no relationship with iron status in men carrying HFE mutations, hereditary haemochromatosis patients undergoing phlebotomy treatment, or pregnant women. *Br J Nutr* **97**, 544–549.
- Calder PC, Krauss-Etschmann S, de Jong EC, *et al.* (2006) Early nutrition and immunity – progress and perspectives. *Br J Nutr* **96**, 774–790.
- Lillicrop KA, Slater-Jefferies JL, Hanson MA, *et al.* (2007) Induction of altered epigenetic regulation of the hepatic glucocorticoid receptor in the offspring of rats fed a protein-restricted diet during pregnancy suggests that reduced DNA methyltransferase-1 expression is involved in impaired DNA methylation and changes in histone modifications. *Br J Nutr* **97**, 1064–1073.
- Gil-Campos M, Aguilera CM, Cañete R, *et al.* (2006) Ghrelin: a hormone regulating food intake and energy homeostasis. *Br J Nutr* **96**, 201–226.
- Mullen W, Edwards CA & Crozier A (2006) Absorption, excretion and metabolite profiling of methyl-, glucuronyl-, glucosyl- and sulpho-conjugates of quercetin in human plasma and urine after ingestion of onions. *Br J Nutr* **96**, 107–116.
- Burdge GC, Hanson MA, Slater-Jefferies JL, *et al.* (2007) Epigenetic regulation of transcription: a mechanism for inducing variations in phenotype (fetal programming) by differences in nutrition during early life? *Br J Nutr* **97**, 1036–1046.
- Thijssen HH, Vervoort LM, Schurgers LJ, *et al.* (2006) Menadiol is a metabolite of oral vitamin K. *Br J Nutr* **95**, 260–266.
- Li P, Yin YL, Li D, *et al.* (2007) Amino acids and immune function. *Br J Nutr* **98**, 237–252.
- Salvini S, Sera F, Caruso D, *et al.* (2006) Daily consumption of a high-phenol extra-virgin olive oil reduces oxidative DNA damage in postmenopausal women. *Br J Nutr* **95**, 742–751.
- Golan M, Kaufman V & Shahar DR (2006) Childhood obesity treatment: targeting parents exclusively v. parents and children. *Br J Nutr* **95**, 1008–1015.
- Kamphuis CB, Giskes K, de Bruijn GJ, *et al.* (2006) Environmental determinants of fruit and vegetable consumption among adults: a systematic review. *Br J Nutr* **96**, 620–635.
- Arnaud J, Bertrais S, Roussel AM, *et al.* (2006) Serum selenium determinants in French adults: the SU.VI.M.AX study. *Br J Nutr* **95**, 313–320.
- Goyenechea E, Dolores Parra M & Alfredo Martínez J (2006) Weight regain after slimming induced by an energy-restricted diet depends on interleukin-6 and peroxisome-proliferator-activated-receptor- γ 2 gene polymorphisms. *Br J Nutr* **96**, 965–972.
- Bergstrom C (2009) Methods – eigenFACTOR.org – ranking and mapping scientific journals. <http://www.eigenfactor.org/methods.htm>