Using University Research in Food Science to Study their Characteristics and to Model the Research and Information Needs of Researchers

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Introduction
We present a methodology to study the characteristics of the research output from a university department, in this case, the Department of Food Science at the University of Arkansas. The faculty publications and their cited references over a ten-year period (2008 – 2018) were used as the basis for this study.

Objectives of the Study
- Identify the publishing patterns and the types of material faculty are publishing
- Identify a core set of journals and other resources they are publishing in and citing
- The characteristics of the journals in which they publish and cite
- The degree of openness of their publications and their citation advantage, if any;
- The age of resources that are referenced

Methodology
- The Web of Science Core Collection, Food Science and Technology Abstracts and CABI Abstracts were used to identify the publications
- Records were exported into RefWorks and the duplicates were removed
- For records not found in Web of Science core collection, the references were gathered from the documents
- The publications and their cited references were separated into their component fields and these were used for further analysis based on several parameters.

Results of the Study: Faculty Publications
- 1000 publications were identified from 2008 to 2018
  - an average of 91 publications per year
- 40,006 cited references
  - 88 percent (n=8800) of them were published in 220 journals consisting of 805 articles. The ratio of journal articles to other publications is 4:1

Bradford Distribution of Journals
- Forty-eight journals published 70.4 percent (n=567) of all the papers published — essential for collection

JCR Categories and Ranking of Journals
- The 805 journal articles are published in 189 journals that are indexed in JCR (31 titles not found)
- 77 unique categories — indicating the multidisciplinary nature of research
- Top 6 categories account for 47.6 percent of all the journals:
  - Food science and technology; microbiology; biotechnology and applied microbiology; nutrition and dietetics; applied chemistry; and agronomy
- Most of their research articles (n=555, 73.1 percent) are published in Quartile 1 and Quartile 2 journals
- 77 journals (42.2 percent) in quartile 1, 54 (30.4 percent) in quartile 2, 39 (20.3 percent) in quartile 3 and 19 (6.8 percent) in quartile 4

Open Access Versus Non-Open Access
- 239 out of 1000 (23.9 percent) of their publications are freely available
- 212 (25.9 percent) of the journal articles are open under 4 categories
- 27 documents (9 Gov. Documents and 18 patents)
- For articles published in 6 of the 11 years the average citations were higher for non-OA articles
- Independent Samples T-Test indicates that there is no significant difference in the number of citations between OA and Non-OA publications
- 34.0 percent of the Non-OA articles have between 6-18 citations versus 34.4 percent of the OA papers.
- 23.2 percent of the non-OA papers have above 18 citations versus 23.3 percent of the OA papers.

Other Characteristics
- The researchers cite 199 (90.5 percent) of the 220 journals that they publish in.
- Of the top 45 journals that they cite, they did not publish in 11 of them.
- The six top journals that they heavily cite and did not publish in are:
  - Journal of Bacteriology (371 times)
  - Science (266 times)
  - PNAS (256 times)
  - Infection and Immunity (240 times)
  - Emerging Infectious Diseases (237 times)
  - Journal of Clinical Microbiology (208 times)
- Four hundred and sixty one journals (15.1 percent) cited more than ten times accounts for 81.7% of all citations to journal articles.
- 18.3 percent of all cited references are scattered in 2,596 journals.
- Of these, 1,267 (41.4 percent) journals are cited only once

Conclusion
- The researchers in the food science department publish an average of 91 publications per year
- The ratio of journal articles to other types of publications is 4 to 1.
- Their publication pattern follows the Bradford distribution.
- The researchers published their research papers in 220 journals spanning 77 different publishers.
- 69.3 percent of the articles published in JCR quartile 1 and 2 journals.
- The majority of their article publications (97.4 percent) have 2 or more authors indicating the collaborative nature of research.
- 1 in every 4 research articles are freely available. An Independent Samples T-Test indicates that there is no significant difference in the number of citations between OA and Non-OA articles.
- The ratio of journal articles to books that the faculty cite is 14.98 to 1.
- Most of the publications they cite were between 1 and 15 years old, only 7.1 percent of their citations were older than 30 years.
- The researchers cite 90.5 percent of the journals in which they publish.