Journals in the category "Food Science & Technology" in the Journal Citation Report database

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ABSTRACT

Different models of scientific communication are becoming more universal and the opportunities of publishing are more numerous and sophisticated. This study analyzed the category "Food Science & Technology" in the Journal Citation Reports (JCR) database to determine how many journals are currently in it, how many journals are in several scientific categories, how many journals are published by commercial and by non-commercial publishers, what are the publishing models of each journal, journal impact factor (IF) and quartile - Q. The analysis of the publishing models and quartiles in which the journal is located showed that IF and the reputation of the journal are more important to scientists for publishing the results than the publishing policy. The interdisciplinarity of the field was determined through different WoS categories because the journals were included in 25 other categories in addition to the “Food Science & Technology” category.

Introduction

Scientific communication is a formal way of communication among scientists that occurs today through traditional (journals, monographs, conferences, projects) and non-traditional communication channels (private correspondence, blogs, social networks and other e-channels). The aim of scientific communication is to share scientific information within the scientific community, but also within the economic and social community, because the application of new knowledge and technologies develops social and economic segments of the community. The dominant channels for scientific communication in the humanities and arts are still monographs, while in the social sciences the journals are increasingly prevalent, and in the STEM fields (science, technology, engineering and mathematics - STEM) the journal has always been the most important communication channel. The scientists publish their scientific achievements according to the set standards of quality of scientific work in journals that enable the evaluation of achievements, and as a result they receive recognition in the scientific field and the advancement in the structure of the scientific community (Borgman, 2009).

In the 2020 model, Hurd predicted transformations in scientific communication back in the year 2000, and came to the conclusion that the system for delivering scientific communication results would rely on electronic communication and media (Hurd, 2000), i.e. the development of the technology created conditions for sharing the information on a global level, interactive access to information that is not limited in time and space, and in the e-journals longer and more comprehensive information (text, image, sound, video) can be presented (Hasenay and Mokriš Marendić, 2009). As the scientific communication grew and as it became increasingly difficult to keep track of all published papers, the need for unification...

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arose. In the second half of the 20th century, various databases began to be intensively developed, which made it possible to search a large number of publications by various publishers. One of the most important databases is WoS CC as a source of data for research on scientific and communication activities (Birkle et al., 2020), and the Journal Citation Reports (JCR) citation database is used to evaluate scientific communication and determine the quality of journals within each scientific field. The emergence of increasingly sophisticated interfaces and tools has enabled different strategies for publishing scientific results, depending on the scientific field in which scientific communication takes place, and a browsing strategy that depends on quick query (trial and error tactics) (Vakkari and Huuskonen, 2012) by linking various documents to similar or the same topics, which ultimately leads to easier use of the network as a source for information searching.

For the scientific communication in the field of biotechnical sciences, which belongs to the STEM field, the journal is the primary channel for communication. According to the Ordinance on Scientific and Artistic Fields, Disciplines and Branches (NN 32/13, 2013), there are seven disciplines in the scientific field of biotechnical sciences: Agriculture (agronomy), Forestry, Wood technology, Biotechnology, Food technology, Nutrition and Interdisciplinary biotechnical sciences. For each discipline, there are scientific categories within the JCR. In this research, an analysis of the journals for the discipline of Food Technology was made. It is often a great challenge for scientists to choose a journal for publishing the results of their scientific research, which will be considered as A1 papers in the process of advancement into academic rank according to the Ordinance on the Conditions for the Advancement into Academic Rank Article 16, Item 2 (NN 28/2017), in the discipline and the field in which the rank is chosen, because when choosing a journal, scientists choose prestigious journals with a high impact factor (IF) to publish their results (Baffy et al., 2020), but the authors find also important the reliability of the peer review, the usefulness of the reviewers’ feedback, the reputation of the journals and the belief that their article is within the scope of the journal (Rowley et al., 2020), furthermore, they have to select the journals that are in the certain scientific categories1 and scientific fields within the JCR, since it is crucial for the calculation of the bibliometric indicators in the quantitative evaluation of the scientific work of an individual scientist for the advancements in the academic ranks. In the A1 papers, in the scientific discipline of Food Technology, there are also papers indexed in the Emerging Sources Citation Index (ESCI), but only those published after 2017.

Scientific publishing

Unlike literary publishing, where publishers pay the authors for publishing their works, in scientific publishing the authors often publish the results of their research free of charge, and for the purpose of scientific communication, often transferring the copyright for the published work to the publisher. In scientific publishing, there are different stakeholders with different priorities: publishers (publishing and making a profit), libraries (accessibility, archiving and storage), scientists (communication and reputation) and readers (free access) (Baffy et al., 2020). The role of the scientists in scientific publishing is multiple because they can be: authors (publishing the results of their research), reviewers (evaluation and control), editors (responsibility for published works) and readers (communication).

There are commercial and non-commercial publishers of scientific journals. Commercial publishers (e.g. Elsevier, Springer, Wiley, etc.) base their business models on creating the value for the benefits of their shareholders (Copiello, 2020), while non-commercial publishers (scientific institutions, associations, societies, etc.) do not charge for publishing or accessing the papers in journals, but they are funded by various subsidies and donations. With the development of digital publishing, there have been changes in scientific publishing as the most printed journals nowadays have their e-versions, and also an increasing number of journals publish only in the e-form. In addition to the subscription model for each journal, various other business models have emerged. Among the first business models of scientific publishing are the so-called "big deal" model and the open-access (OA) model.

"Big deal"

"Big deal" is a model in which publishers prepare collections of journals in their own edition, and after paying the subscription (either individual, institutional or consortial), users are given access via IP addresses of the institutions or consortia. The results of using this model are questionable, because on the one hand there are publishers who make profit and on the other hand

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1 Each entry in the basic Web of Science collection contains the category of the original publication in the Web of Science Categories field. Available at:

https://images.webofknowledge.com/images/help/WOS/hp_subject_category_terms_tasca.html
there are users who have access to a large number of journals many of which they have no interest for (Baffy et al., 2020). In these turbulent times for scientific publishing, libraries and library consortia have a great responsibility to systematically analyze and monitor the scientific communication of the scientists at the institutions, retrieval of information, funding sources for research publishing and other metrics in order to reach better agreements in negotiations with commercial publishers for the various accesses to journal collections offered by individual publishers (Machovec, 2020).

**Open access (OA)**

With the development of the Internet, the way of sharing scientific information has also changed, the possibility of sharing scientific information on a global level without compensation, for the purpose of sharing knowledge, has been achieved. According to the Budapest Open Access Initiative in 2002, the Berlin Declaration in 2003 and the Croatian Open Access Declaration (Declaration - Open Access – Open Access to Scientific Information, 2012) in 2012, the open access is defined as: "unrestricted, free, and undisturbed online access to digital scientific information that allows scientific information to be read, stored, distributed, searched, reached, indexed and/or used in any other legal way" that is, completely free access to scientific information, but with respect for copyright protection (supervision over the integrity of the work and proper citation).

According to Suber, OA is the online information free of charge and free of greater restrictions on copyright and licenses, and there are two models of open access: *gratis* (provides free access, but restrictions remain) and *libre* (free access, but some Creative Commons licenses must be used) (Suber 2012). There are Gold OA (free access after publishing) and Green OA (supports self-archiving in various repositories or personal websites) used in OA. The Gold OA has several publishing models: the pay article-processing charges (APC) model paid by the authors or institutions, the diamond model is usually sponsored (lump-sum periodic payments), and publishing for authors and access for readers are unlimited, while some publishers use a hybrid model (subscription charging but also APC option) (Baffy et al. 2020; Macan 2018) which is the most unfavorable form because the same information is paid twice, on the one hand the libraries pay for the subscription and on the other hand the authors pay for the open access publication. Recognizing the need to change the way of publishing of scientific works, academic libraries advocate for a change from a subscription model to the OA model with APC (Machovec, 2020), and this process has been further accelerated by the Plan S, an initiative for OA to all publicly funded scientific research ("Plan S' and 'COAlition S' - Accelerating the Transition to Full and Immediate Open Access to Scientific Publications", 2018). Some publishers (e.g. Springer Nature) have committed to full-text publication in OA, and are in the process of changing from a subscription or hybrid model of publishing to the OA, and such journals are called Transformative Journals (Open Research | Springer Nature, 2019).

Although the OA for scientific communication has many more advantages and possibilities, with the advent of the OA, the so-called "predatory publishers” have also appeared. "Predatory publishers” publish journals in OA with APC, but without conducting a review process, quality editorial policy and their only goal is to achieve financial gain (Beall, 2012). Such publishing of scientific results is unprofessional and illegitimate, and ultimately the authors (mostly young scientists who are not yet familiar with all the rules of scientific communication and publishing) are deceived because they think they have published a paper in a relevant journal. In order to avoid problems with the selection of journals for the publication of research results, libraries should systematically conduct information literacy trainings.

**Scientific journals**

Scientific journals are the fundamental communication channels for publishing scientific achievements among scientists in the STEM fields. The Croatian Encyclopedia, among other things, states that: "Scientific journals provide four basic functions in the social system of science: communicative, formatting, environmental function and the function of a permanent archiving of science. These functions are interdependent. According to their communicative function, journals are among the formal manifestation of communication in science. Journals shape relationships and the most important means of institutionalizing of science: the relationships among scientists as authors, reviewers and editors on the one hand and publishers on the other, and the institutes such as scientific authority, quality control mechanisms, the public, ethical norms of freedom, responsibility and trust, intellectual property right and priority in publishing right and the right to protection of these rights. These institutes are universal for all sciences and at the same time specific for each special scientific community in a given scientific field, and the journals themselves are constitutive for these special communities or, in other words, sciences without journals are not possible.” ("Journal | Hrvatska
Enciklopedija (Croatian Encyclopedia)” 2021.). Since the middle of the 20th century, there has been an increasing number of scientific journals focused on certain scientific fields, but there are also wide-range journals (e.g. Nature or Sciences) that publish papers from different scientific fields, and papers are selected on the basis of originality, importance, interdisciplinary interest and are subjected to review procedure, and the impact of published papers is increasing. In 2006, the first mega-journal PLOS One appeared, followed by Scientific Reports. The mega-journals have four characteristics: wide scope, large publiclist writing, the APC model and the editorial policy based on the selection according to the technical or scientific contribution and with one blind review (Wakeling et al., 2019) (“PLOS ONE: Accelerating the Publication of Peer-Reviewed Science” n.d.).The different elements are used to assess the quality of the category, and although bibliometric experts and librarians always emphasize that the assessing of the quality of a journal should be approached multidimensionally (Macač and Petarak, 2015; Moed, 2005; Garfield, 2006), for the most authors the impact factor (IF) is still considered to be the most important element.

**Web of Science Core Collection Database (WoS CC)**

The Web of Science Core Collection (WoS CC) with its Science Citation Index Expanded (SCI-EXPANDED), Social Sciences Citation Index (SSCI), Conference Proceedings Citation Indexes - Science (CPCI-S), and Emerging Sources Citation Index (ESCI)2 is the oldest and the most respected database that is used in a variety of ways, from daily information seeking and information searching to the use of analytical data sets for bibliometric analysis. The main feature of the WoS CC database is its journal selectivity which is focused on the international impact of the journal. Due to the growing number of journals, Clarivate Analytics published a new Emerging Sources Citation Index (ESCI) in 2015, which includes journals that have passed the editorial evaluation (24 evaluation criteria) as the first step in inclusion in some of the aforementioned citation indexes (“ESCI”, n.d.). Nowadays, WoS CC is a balanced database with the complete citation links and enhanced metadata that support a wide range of informational purposes. The data in WoS CC is used not only for information retrieval but also for the various analyses, trend tracking, research impact assessments, topic mapping, etc. In order to improve retrieval of the necessary information within WoS, the WoS Subject Categories scheme has been developed, and currently there are 254 categories based on the journals and scientific fields they belong to, and it allows filtering by category, but it should be noted that due to interdisciplinarity the journals are often put in several different categories (Birkle et al., 2020).

5. **Journal Citation Reports Database (JCR)**

Journal Citation Reports is a part of the "Web of Science family", and serves to evaluate and identify prestigious world journals from all fields of science. The data available in the JCR are used by scientists to select journals for publishing their research results, and by researchers to conduct various analyses (Journal Citation Reports, n.d.). "Food Science & Technology" is a scientific category of JCR that is classified in the group "Biology & Biochemistry; Chemistry; Engineering", which includes resources related to various aspects of food research and production, including food additives and contaminants, food chemistry and biochemistry, meat science, microbiology and food technology, milk science, food engineering and processing, cereal grain science, brewing and food quality and safety. Figure 1. (“Food Science & Technology - Category”, n.d.). Table 1 shows the profile of the category from which it is clear that it belongs to the Science Citation Index Expanded (SCI-EXPANDED) edition, and the analysis reveals that it is a relatively new category because the first indicators for the journals could be calculated only in 2003. All indicators relevant to the category, from the number of published papers (Articles), the total number of citations (Total Citates) over the average value of all journals’ IF in the category (Median Impact Factor) to the total IF (Aggregate Citing Half-Life), are constantly growing. Since 2021, the Emerging Sources Citation Index (ESCI) edition has been formed in the JCR, in which Food Technology currently has 20 journals. JCI is a new indicator in JCR that, among other indicators, can be used to evaluate journals. The JCI normalizes the relative impact of citations of a particular journal as the ratio of citations in the subject category, e.g. the values greater than 1.0 mean that the impact of citations is higher than the average citations in the category and vice versa, less than 1.0 indicates citations lower than the category average (Director and Clarivate 2021). It should be emphasized that the journals indexed in the ESCI edition do not have calculations for IF and their corresponding Q, but they are classified according to the Journal Citation Indicator (JCI) and are therefore not presented in this study.

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2 Citation indices available to the Croatian Academic Union
Figure 1. Category Food Science & Technology

Table 1. Profile of the category in JCR "Food Science & Technology"³

<table>
<thead>
<tr>
<th>Year</th>
<th>Edition</th>
<th>#Journals</th>
<th>Articles</th>
<th>Total Cites</th>
<th>Median Impact Factor</th>
<th>Aggregate Impact Factor</th>
<th>Aggregate Immediacy Index</th>
<th>Aggregate Cited Half-Life</th>
<th>Aggregate Citing Half-Life</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>SCIE</td>
<td>144</td>
<td>35,115</td>
<td>1,394,057</td>
<td>2.724</td>
<td>4.309</td>
<td>1.127</td>
<td>7.1</td>
<td>7.6</td>
</tr>
<tr>
<td>2019</td>
<td>SCIE</td>
<td>139</td>
<td>28,527</td>
<td>1,051,204</td>
<td>2.095</td>
<td>3.279</td>
<td>0.828</td>
<td>7.4</td>
<td>8.0</td>
</tr>
<tr>
<td>2018</td>
<td>SCIE</td>
<td>135</td>
<td>26,239</td>
<td>913,528</td>
<td>1.720</td>
<td>2.851</td>
<td>0.698</td>
<td>7.6</td>
<td>8.3</td>
</tr>
<tr>
<td>2017</td>
<td>SCIE</td>
<td>132</td>
<td>22,201</td>
<td>684,982</td>
<td>1.419</td>
<td>2.326</td>
<td>0.523</td>
<td>7.7</td>
<td>8.5</td>
</tr>
<tr>
<td>2016</td>
<td>SCIE</td>
<td>125</td>
<td>22,571</td>
<td>628,901</td>
<td>1.222</td>
<td>2.077</td>
<td>0.409</td>
<td>7.5</td>
<td>8.7</td>
</tr>
<tr>
<td>2015</td>
<td>SCIE</td>
<td>123</td>
<td>19,963</td>
<td>503,290</td>
<td>1.206</td>
<td>2.066</td>
<td>0.367</td>
<td>7.2</td>
<td>8.5</td>
</tr>
<tr>
<td>2014</td>
<td>SCIE</td>
<td>123</td>
<td>19,879</td>
<td>460,291</td>
<td>1.207</td>
<td>1.947</td>
<td>0.333</td>
<td>7.2</td>
<td>8.5</td>
</tr>
<tr>
<td>2013</td>
<td>SCIE</td>
<td>128</td>
<td>18,470</td>
<td>421,932</td>
<td>1.165</td>
<td>1.898</td>
<td>0.315</td>
<td>7.2</td>
<td>8.5</td>
</tr>
<tr>
<td>2012</td>
<td>SCIE</td>
<td>128</td>
<td>17,763</td>
<td>375,442</td>
<td>0.930</td>
<td>1.823</td>
<td>0.313</td>
<td>7.2</td>
<td>8.5</td>
</tr>
<tr>
<td>2009</td>
<td>SCIE</td>
<td>118</td>
<td>15,806</td>
<td>335,591</td>
<td>0.939</td>
<td>1.777</td>
<td>0.298</td>
<td>7.2</td>
<td>8.4</td>
</tr>
<tr>
<td>2008</td>
<td>SCIE</td>
<td>107</td>
<td>14,568</td>
<td>291,502</td>
<td>0.993</td>
<td>1.717</td>
<td>0.273</td>
<td>7.1</td>
<td>8.4</td>
</tr>
<tr>
<td>2007</td>
<td>SCIE</td>
<td>103</td>
<td>14,306</td>
<td>257,166</td>
<td>0.911</td>
<td>1.583</td>
<td>0.281</td>
<td>7.2</td>
<td>8.6</td>
</tr>
<tr>
<td>2006</td>
<td>SCIE</td>
<td>96</td>
<td>11,934</td>
<td>215,707</td>
<td>0.857</td>
<td>1.466</td>
<td>0.231</td>
<td>7.3</td>
<td>8.5</td>
</tr>
<tr>
<td>2005</td>
<td>SCIE</td>
<td>93</td>
<td>11,052</td>
<td>189,422</td>
<td>0.708</td>
<td>1.346</td>
<td>0.202</td>
<td>7.3</td>
<td>8.6</td>
</tr>
<tr>
<td>2004</td>
<td>SCIE</td>
<td>94</td>
<td>9,936</td>
<td>169,623</td>
<td>0.635</td>
<td>1.257</td>
<td>0.192</td>
<td>7.4</td>
<td>8.6</td>
</tr>
<tr>
<td>2003</td>
<td>SCIE</td>
<td>94</td>
<td>9,783</td>
<td>152,602</td>
<td>0.627</td>
<td>1.159</td>
<td>0.188</td>
<td>7.4</td>
<td>8.7</td>
</tr>
<tr>
<td>2002</td>
<td>SCIE</td>
<td>92</td>
<td>11,763</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>2001</td>
<td>SCIE</td>
<td>94</td>
<td>Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>2000</td>
<td>SCIE</td>
<td>95</td>
<td>Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>1999</td>
<td>SCIE</td>
<td>91</td>
<td>Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>1998</td>
<td>SCIE</td>
<td>90</td>
<td>Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
<tr>
<td>1997</td>
<td>SCIE</td>
<td>87</td>
<td>Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
<td>Not Available</td>
</tr>
</tbody>
</table>

The aims and methods of research

The aims of this study were to determine how many journals are in the WoS CC category of “Food Science & Technology”; how many journals are published by commercial and non-commercial publishers; what is the publishing policy of a particular journal and the interdisciplinarity of the scientific field. After reviewing the journals in the category "Food Science & Technology", a descriptive analysis was made for each journal in the JCR to determine the interdisciplinarity of the journal and the journal’s website to discover the publication models and scientific topics covered in these journals. The survey was conducted in the period from 1 to 12 February 2022.

Results and discussion

The analysis of the Food Science & Technology category revealed a steady increase in the number of journal titles from the year 1997 (87 titles) to 2020 (144 titles in which 35115 papers were published) (Table 1). All the titles in Table 1 are linked to the journals’ websites with the instructions on how to publish. The largest IF 13.635 has the journal "Annual Review of Food Science and Technology" published by the American publisher Annual Reviews, the journal has one volume and one issue per year. This journal is in the citation index SCIE from the first volume in 2010 when it did not have IF and was in Q4, and already in 2011 IF was 3.600 and classified in Q1. The first quartile (Q1) includes 35 journals with an IF range of 4.451 to 13.635, but the largest number of journals in Q1 (14 journals) had an IF range of 5.070 to 5.916. In the second quartile (Q2) there are 36 journals with an IF range of 2.741 to 4.374. The IF range for 36 journals in the third quartile (Q3) is 1.833 to 2.727, while in the fourth quartile (Q4) there is a range of 0.077 to 1.813 and one journal without IF (cf. Appendix 2).

Out of a total of 144 journals in the WoS Food Science & Technology category, 73 titles are exclusively in the Food Science & Technology category, 26 titles are in other categories (Figure 2.): Chemistry, Applied (18 titles) ; Nutrition & Dietetics (14 titles); Biotechnology & Applied Microbiology (11 titles); Toxicology (7 titles); Biochemistry & Molecular Biologist (4 titles); Horticulture (4 titles); Agriculture, Multidisciplinary (4 titles); Agricultural Economics & Policy (4 titles); Chemistry, Medicinal (3 titles); Engineering, Chemical (3 titles); Agronomy (3 titles); Microbiology (4 titles); Pharmacology & Pharmacy (2 titles); Agriculture, Dairy & Animal Science (2 titles); Chemistry, Analytical (2 titles); Neurosciences (2 titles); Entomology (1 title); Plant Sciences (1 title); Spectroscopy (1 title); Mycology (1 title); Behavioral Sciences (1 title); Physiology (1 title); Environmental Sciences (2 titles); Engineering, Manufacturing (1 title); Immunology (1 title). A review of the journals' websites showed that for all titles classified in the JCR only in the Food Science & Technology category, the goals and scientific topics cited by the journal are much broader, and other categories could be assigned to them in the WoS scientific categories.

The analysis of the journal publishers showed that 103 journals were published by commercial publishers (Elsevier, Wiley, Springer, etc.), and the remaining 41 titles were published by various faculties, institutes, unions and associations (Figure 3).

The analysis of the models used to publish in WoS journals in the Food Science & Technology category (Figure 4) shows that the largest number of the titles was published in one of the Gold OA models: the hybrid model (90 titles), then the the pay article-processing charges (APC) model (22 titles), although transformative journals are in fact hybrid for the purposes of this research have been singled out as a separate part (10 titles), then the so-called diamond model, model without fee for publishing and accessing the published works (12 titles) and model of free publishing but with subscription for access to published works (10 titles). Most Gold OA titles support self-archiving in different repositories or personal websites (Green OA) but under different conditions (e.g. all Elsevier publishers have an embargo of 12 months).

According to the data in the JCR, out of 144 journals in the Food Science & Technology category, 26 journals are in OA (Appendix 2). However, an analysis of the web pages of each title found that eight more journals have OA: CYTA-Journal of Food, Journal of Oil Palm Research, Journal of Oleo Science, Ciencia e Tecnica Vitivinicola, Irish Journal of Agricultural and Food Research, International Food Research Journal, Listy Cukrovarnicke A Reparske, Rivista Italiana Delle Sostanze Grasse.

The analysis shows that, out of a total of 34 titles in OA, 12 titles have the diamond model, and 22 titles have the APC model, but it was also found that the largest number of journals in OA from both publication models is in the fourth quartile (Figure 5).

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4 In Table 1. marked in gray
Figure 2. Other categories in which journals are included

Figure 3. Number of journals per publisher
Figure 4. Number of journals classified according to the publishing model

Figure 5. Number of journals classified according to the publication model in OA and quartiles
Conclusions

With the development of technology, interfaces and tools used in scientific publishing are also being developed. Different models of scientific communication are becoming more universal, and the possibilities for publishing are more numerous and sophisticated. Due to growing public pressure for OA scientific information, commercial publishers have realized that they have to change their business policy in scientific publishing and together with the traditional publishing models offer the opportunity to publish in OA with APC, and more and more commercial publishers (Springer, Elsevier, Wiley) have so-called transformative journals that are in the process of a complete transition from a hybrid model to an OA.

To the scientists in the field of biotechnical sciences in the discipline of Food Technology in the Science Citation Index Expanded (SCI-EXPANDED) in the WoS category Food Science & Technology were offered 144 titles distributed in four quartiles according to the IF of each journal with a tendency for a constant increase in the number of titles, as in the ESCI citation index there are 20 titles that belong to the category of Food Science & Technology. The fact of the interdisciplinarity of the fields determined through the different WoS categories should certainly not be overlooked, since except in the category of Food Science & Technology journals are included in 25 other categories: Chemistry, Applied (17 titles); Nutrition & Dietetics (14 titles); Biotechnology & Applied Microbiology (11 titles); Toxicology (6 titles); Biochemistry & Molecular Biology (4 titles); Horticulture (4 titles); Agriculture, Multidisciplinary (4 titles); Agricultural Economics & Policy (4 titles); Chemistry, Medicinal (3 titles); Engineering, Chemical (3 titles); Agronomy (3 titles); Microbiology (3 titles); Pharmacology & Pharmacy (2 titles); Agriculture, Dairy & Animal Science (2 titles); Chemistry, Analytical (2 titles); Neurosciences (2 titles); Entomology (1 title); Plant Sciences (1 title); Spectroscopy (1 title); Mycology (1 title); Behavioral Sciences (1 title); Physiology (1 title); Environmental Sciences (1 title); Engineering, Manufacturing (1 title); Immunology (1 title). Some of these categories cover scientific disciplines in the scientific field of biotechnical sciences (nutrition, agriculture, ecology, biotechnology), then, the scientific field of natural sciences in the disciplines of chemistry and biology, the scientific field of biomedical sciences in the disciplines of basic medical science, pharmacy, immunology, the scientific field of technical sciences in the disciplines engineering, chemical engineering.

Although the WoS category Food Science & Technology contains 26 OA journals, a detailed analysis of the journals' websites identified eight more OA journals: CYTA-Journal of Food, Journal of Oil Palm Research, Journal of Oleo Science, Ciencia e Tecnica Vitivinicolica, Irish Journal of Agricultural and Food Research, International Food Research Journal, Listy Cukrovarnicke A Reparske, Rivista Italiana Delle Sostanze Grasse. By comparing the models of publishing and quartiles in which the journal is placed, it was confirmed that the IF, the reputation of the publication and the publishing speed are more important to the authors to publish their research results than the possibility of OA.

Both commercial and non-commercial publishers of the journals on food technology have recognized the importance of adapting to the new technologies and trends in scientific publishing and the vast majority are adjusting to open access in scientific achievements.

The results of this research should be useful for facilitating and guiding scientists in the field of Biotechnical Sciences in selecting scientific journals in which they publish their research results.

References


what and how?). In: Otvorenost u znanosti i visokom obrazovanju (Openness in science and higher education), Hebrang Grgić, Ivana (ed.), Zagreb, Školska knjiga, pp. 59-79.


## Appendix 1. Journals in the category Food Science & Technology included in JCR for 2020.5

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## Appendix 2. OA journals in the field of Food Science & Technology

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