Mapping of the Research Output in Food Economics: A Scientometrics View of the Scopus Database

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Abstract

Since food is considered important in the world, the current study analyzed the characteristics of scientific publications based on several subtle indicators of scientometrics in the field of food economics for strengthening public health in the future. Accordingly, a total of 26306 publications from 1915 to 2021 are evaluated based on the Scopus database with the help of scientific tools such as Hitcite, Biblioshiny and VoS viewer. The results show that the resourcefulness experts are identified in terms of their publication only, that namely Drewnowski, Kesselheim. On the other hand, the author Popkini is considered as the key author rather than the above-said authors in terms of global citations. The similarity in the above context is that all the topmost authors belong to the USA. More importantly, the summary of citations in total publication output is revealed that a single paper is recorded the range of citations between 1042-2766, the 500 citations are recorded from the 64 papers, and 844 papers accounted with more than 100 citations.

Keywords: *Food, Economics, Scientometrics, Publication, Author, Output, Citation*

Prologue

The ideal concept of Food and Economics that are the most an important literature aspects be reviewed and resolved in terms of its current trend activities to maintain the sustainable resources in the world [20]. The demanding of Food has been wobbling during the COVID-19, as, consequently, 132 million people have suffered from hungry as per report of Alders & Dar [16], and food commodity price is also raised by restriction of travelling between state to state and region to region due to global lockdown [19].

In the 21st century, seeing influence intelligence as a sign of scientific development, it has become very simple. In today's scenario, we have a huge development plan to be executed if we focus on it as micro-level reviewing in the scientific literature in terms of a systematic manner[1], [6]. If looking such like that, the Bibliometrics or scientometrics that sub-field of library & information science is helping to frame the research performance so as to identify the key subject experts [4], [13]. Scientometrics analysis is not only to identify the importance in the research domain, but it also helps in making decision policy that [10,[11] through publication impact as well as the citation impact supports in framing the research proposals for the country development [21].

As such reflecting of citation impact, the resourcefulness authors through micro-level, and country & institution under macro-level would be identified. Furthermore, scientometrics can promote the academic culture across the world by research contributions [5]. Generally, many

successful projects, particularly in the most developed countries executed through such kind of scientific evaluation approach, namely the H - Index and Impact Factor on channel of publication. Therefore, extracting the quantity as well as quality in research contribution can be filtered by adopting scientometrics tools on concerned the filed in publication output. [2].

Since the new global coronavirus outbreak (COVID-19), many people could not balance their vitamin healthy food due to continued lockdown, causing poverty leads to raise death day by day [22]. In this situation, the resolutions to be needed to frame the new policy towards the county development, particularly in public health that to be monitored in terms of research publication output of experts and Research scholars as well as Post Graduate scholars [15].

In this circumstance, the experts' special attention to public health likely will increase in further development. Concentrating the food loss and waste in the present scenario is an important one in curtaining the production cost and maintaining the better environmental sustainability [14]. Moreover the food loss leads to make heavy price laying on agricultural commodities and decrease in quantity as well as quality between supplier and end user.

As per interpretation given by Gonzalez-Alcaide, [7] on their earlier publications, given the disease burden associated with Chagas cardiomyopathy, a specific analysis of research publications and collaboration networks in this area are warranted to build on the more general bibliometric studies of Chagas disease [11]. Increased knowledge of research in this pathology can help to foster the global collaborations and other research initiatives among endemic countries that nevertheless may have relatively little scientific development of the topic. Moreover, this type of study is useful for the research community, clarifying the main lines of research that are being developed with regard to the diagnostic methods and treatments for the disease.

Therefore, the present study aims to evaluate scientific literature output according to different situation in term of Microanalysis on subject experts, impact journal, Collaboration between countries, citation metrics, visualizing and mapping and the topic addressed [11].

Objectives

The main purpose of this study is that to ascertain the resourcefulness experts from their publications by reflecting their inputs on public health issues from the current research domain of Food economics. The following highlights to be focused by using scientometrics tools: 1.Who are the most significant contributor in Food Economics? 2. Which organization is on the top position in producing the highly impact peer reviewed journal? and 3. Which keyword is playing frequently among the experts.

Material and Mechanism

1. Framing the Research Area

Since this study is closely associated with bibliometric cum scientometrics analysis method, the suitable bibliographical database information is coined and decided to be gathered from the scientific literature under the subject of "Food" and "Economics".

2. Identification of Database Pool

In the current study, the SCOPUS is considered for the retrieving the dataset as it is an internationally accessible database and it is an apt one in the present scenario. The present study has identified the all documents indexed in the SCOPUS according to the descriptor of Food Economics and then restricted the results to the "article" and "review" over the 85 years (1935-2021, Jan 15th). In the spite of publication output in many channels, the article and review are the main document type reference that is shown and interpreted as in table 1 as well as figure 1, which is subjected to evaluation based on the research and development activities on the Microanalysis by author, journal, organization, country and its citations.

Table 1.Channel wise Publication

Publication Media	Output
Article	18823
Review	2685
Conference Paper	1706
Note	988
Book Chapter	549
Editorial	472
Short Survey	376
Letter	319
Book	300
Conference Review	59
Erratum	20
Business Article	1
Data Paper	1
Report	1
Retracted	1
Undefined	5
Total	26306

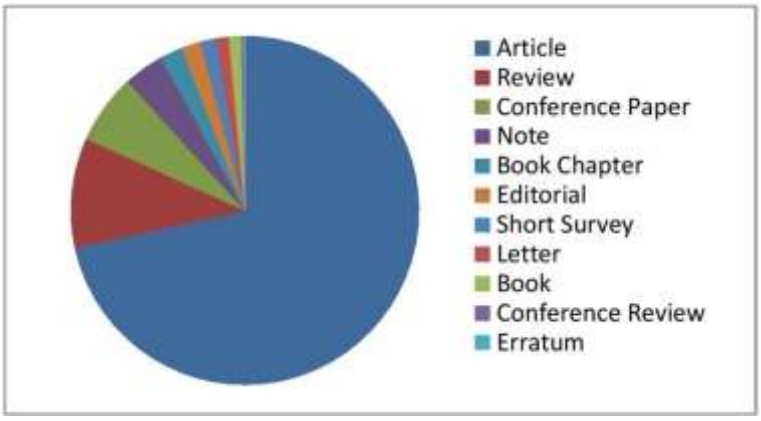

Figure 1.Channel wise Publication

3. Mechanism

The collection of bibliographical dataset is measured with the help of Microsoft Excel after downloading and the same is highlighted by applying in the tabular and graph representation respectively in the different situation, according to necessity of emerging trends with availability of modern research tools such as Hitcite, Biblioshiny and VoS viewer for understanding the performing the research systematically.

4. Overview of Publication

In order to design the research impact in this research domain, the following findings are revealed in the total 26306 publications, 5824 documents are pertaining open access and the remaining 202482 in the subscription base. The summary of citation is that 1 papers are recorded the range of citations between 1042-2766, the 500 citations are recorded from the 64 papers and 844 papers with more than 100 citations.

Data Analysis and Interpretation

The total research contribution has been tabulated from 1915 to 2021 in term of yearly output as per table 2.Because of due to the length of tabulation, a cumulative research output of 26306 is analyzed based on the 10 years inclusive class interval except 2017-2021.Throughout the 85 years, the topmost research contribution is recorded at 43% in 2007-2016 alone, which is also highlighted in figure 2. The rest of the period seems that low level of contribution than aforementioned. However, this is gradually increased and from 1977-1986 the publication output seems that it is double time increased than the previous period up to 1007-2006.

It is noteworthy to understand that the awareness about publication among world experts is not much more concentrated in their healthy feeling. In addition to that, the current analysis came to understand that the reason for the meager output might be either availability of nature, of healthy food or non-availability of proper media for publication.

Table 2. Period wise Research Output

Duration	%	Output
1915-1937	0.05	14
1938-1956	0.08	22
1957-1966	0.3	81
1967-1976	2	553
1977-1986	5	1373
1987-1996	8	2131
1997-2006	16	4205
2007-2016	43	11298
2017-2021	25	6629
	Total	**26306**

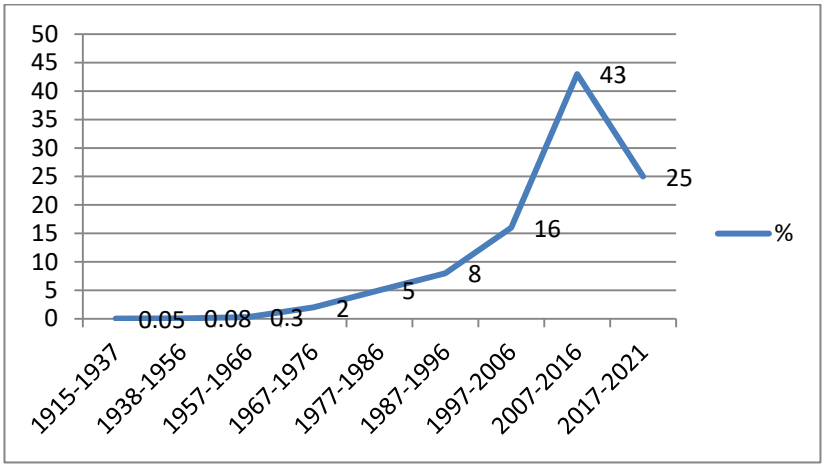

Figure 2.Period wise Output

Identification of Keywords wise Output

Default keywords are listed in terms of availability of publication records as shown in the table 3.The total 26306 data collections are scattered through many keywords that is coined by research experts in their articles, which leads to understanding and retrieve the relevant information about particular types of earlier document[8], whilst reduces the traffic with save the time. In that respect, not only consider the following keyword “Economics” (17006), “Human” (10429) and “Article” (10184) are the major identification of keywords, but the close relationship words pertaining current study are also identified.

Despite the receipting of majority publication that is differed from technical terminology keywords, such as Human (10429), Article (10181), Humans (8975) and United States (5424) are scanned as per the circumstances. As even though, all the keywords are going to thoroughly filtering under the title each publication according to the current study of Food Economics to make them clarity.

Table 3. Article’s Keywords wise Output

Keyword	Records	Keyword	Records
Economics	17006	Health Economics	797
Human	10429	China	783
Article	10184	Metabolism	780
Humans	8975	Economic Aspect	777
United States	5424	Statistics	775
Female	3961	United Kingdom	762
Food Supply	3610	Fruit	755
Catering Service	3274	Health Promotion	753
Male	3202	Animalia	748
Food And Drug Administration	2944	History	739
Animal	2861	Analysis	738
Animals	2854	Sustainability	737
Priority Journal	2820	Meat	712
Agriculture	2515	Food Handling	694
Adult	2356	Land Use	693
Food	1963	Economic Development	689
Review	1916	Questionnaire	688
Diet	1846	Major Clinical Study	686
United States Food And Drug Administration	1826	Vegetable	686
Socioeconomics	1812	Population	677
Food Industry	1790	Risk Assessment	674
Methodology	1671	Growth, Development And Aging	673
Socioeconomic Factors	1614	Food Preference	666
Procedures	1558	Food Safety	662
Nutrition	1542	Preschool Child	662
Organization And Management	1463	Cross-sectional Study	661
Commerce	1455	Food Contamination	658
Controlled Study	1455	Child, Preschool	657
Developing Countries	1430	Infant	651
Child	1388	Population Dynamics	648
Cost Benefit Analysis	1387	Legislation And Jurisprudence	645
Cost	1384	Psychological Aspect	631
Poverty	1358	Cross-Sectional Studies	625
Middle Aged	1348	Europe	625
Food Security	1346	Public Policy	625
Standard	1339	Health Service	620
Commercial Phenomena	1325	Research	620
Developing Country	1317	Food Services	619

Legal Aspect	1310	Cost Control	617
Health Care Policy	1283	Africa	614
Nonhuman	1276	Cost Effectiveness Analysis	614
Financial Management	1223	Food Service, Hospital	609
Adolescent	1217	Health Care Delivery	603
Health Care Cost	1214	Standards	601
Environmental Protection	1208	Clinical Trial	598
Drug Industry	1207	International Cooperation	596
Public Health	1136	Hospital Food Service	594
Government	1129	Nutritional Value	590
Chemistry	1111	Genetics	588
Comparative Study	1111	Consumer	585
Sustainable Development	1104	Food Preferences	577
Education	1087	Agricultural Economics	576
Costs And Cost Analysis	1055	Risk Factor	576
Decision Making	1047	Nutrition Policy	574
Obesity	1037	Demographic Factors	565
Aged	1024	Environmental Impact	561
Drug Approval	1024	Prevalence	558
Demography	1007	Rural Population	554
Drug Cost	1007	Biotechnology	551
Animal Food	996	Caloric Intake	548
Cost-Benefit Analysis	992	Costs	545
Health	992	Asia	536
Conservation Of Natural Resources	991	Family Size	530
Physiology	983	Family Characteristics	529
Policy	977	Food Processing	529
Economic Factors	955	Politics	524
Feeding Behavior	936	Mortality	523
Industrial Economics	904	Practice Guideline	523
Income	896	India	519
Marketing	896	Psychology	518
Climate Change	875	Information Processing	517
Food Intake	870	Crop	513
Environment	863	Time Factors	513
Note	861	Food Production	512
Cattle	859	Vegetables	508
Statistics And Numerical Data	848	Health Care Planning	506
Young Adult	816	Milk	505
Animal Feed	815	Drug Costs	503
Environmental Economics	804	Microbiology	500

Ethnology	801	Food Quality	496

Geographical Research Contributions

The country wise research performance is depicted in the table 4.The top listed 42 out of 160 countries are ranked in terms of their output, in such way, USA (8763) followed by UK (2248), China (1223, Canada (1166) and Australia (1121) are the highest publication. The most rest of the country is having the blow thousands level of research output. In which, India is the 6th placed among the top performances countries and 51 countries have had single digit in their total publication output as from 5 to 2 respectively. This analysis seems that the USA is a predominated in the publication of research activities rather than other countries.

Table 4. Geographical wise Research Publications

Country	Output	Country	Output
United States	8763	Mexico	227
United Kingdom	2248	Indonesia	218
China	1223	Austria	202
Canada	1166	Russian Federation	202
Australia	1121	Nigeria	192
Germany	897	South Korea	189
Italy	816	Ireland	181
India	804	Malaysia	176
France	775	Thailand	165
Netherlands	724	Finland	163
Spain	581	Poland	156
Brazil	443	Czech Republic	154
Sweden	424	Greece	151
South Africa	381	Taiwan	143
Belgium	347	Turkey	143
Japan	340	Pakistan	139
Switzerland	340	Iran	133
New Zealand	300	Portugal	131
Denmark	297	Ethiopia	121
Norway	274	Hungary	112
Kenya	243	Bangladesh	109

Top Author Contributions

Figure3 illustrates the top authors' performance has been exhibited from the different mindset aspects of them. It is found that a very interesting observation in terms of author performance that the Drewnowski from University of Washington in USA, Kesselheim from Brishton & Women's Hospital in USA are considered as most countable publications on the current subject of Food Economics rather than other experts. Whilst, Popkini from University of North Carolina in USA who is going to be considered as an unparalleled expert and resourcefulness author rather than others through not only his citation impact by 56821 but also his h-Index is accounted with 126 from just 47 publications as placing in top while comparing others as shown in figure 6.

Figure 3.Author wise Publication Output

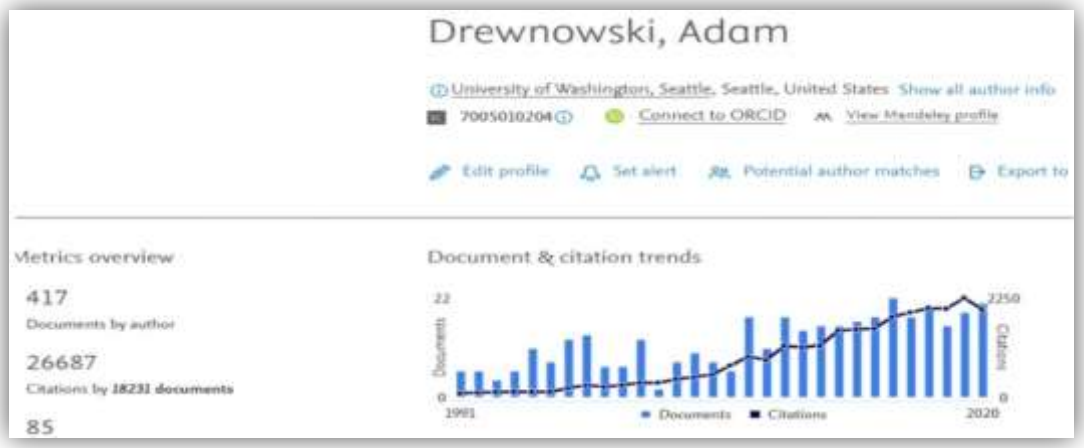

Figure 4-Citation Impact on Author Publication

Figure 5.Citation Impact on Author Publication

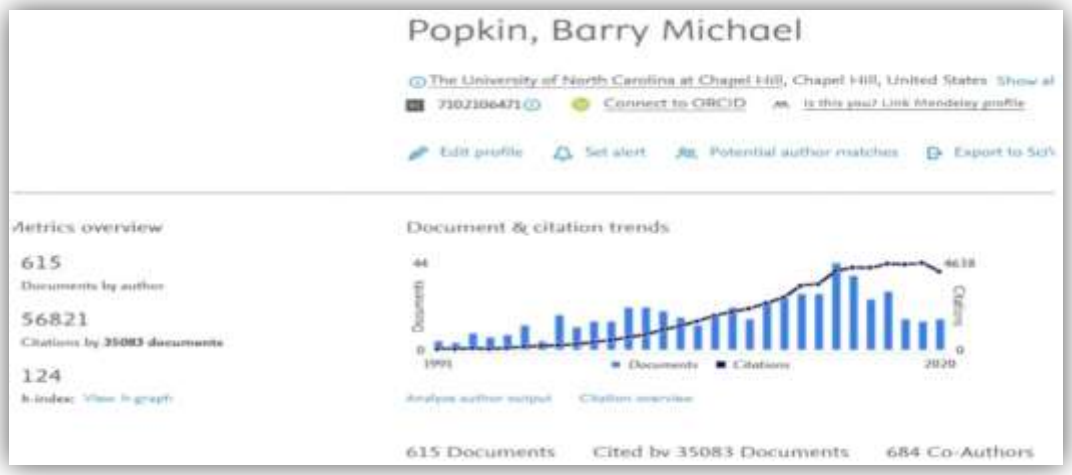

Figure 6.Citation Impact on Author Publication

Figure 7.Citation Impact on Author Publication

Journal wise Publications

The publication of research articles through the world leading publication group has been identified in the table 5, where the topmost journals are position stopped in terms of total publication about the Food Economics since1936.In which them, American Journal of Agricultural Economics (349), Public Health Nutrition (319) and (300) are seem to be on a large scale of publication output.

Between 200-300, publications are namely that Nature, Journal of The American Dietetic Association and Journal of Dairy Science in the second largest level publication contribution group. The other beautiful finding attraction result to others from the current analysis is that the "Nature" that journal group has had a 51 cite score that is highlighted for the value of the world citation influences through the graphical representation than others publication impact as shown in figure 11.

Table 5.Journal wise Research Publications

Source Title	Publications
American Journal Of Agricultural Economics	349
Public Health Nutrition	319
Plos One	300
Nature	262
Journal Of The American Dietetic Association	217
Journal Of Dairy Science	210
Journal Of Agricultural Economics	174
Journal Of The Science Of Food And Agriculture	156
Science	150
Iop Conference Series Earth And Environmental Science	140
Appetite	136
European Review Of Agricultural Economics	136
Journal Of Animal Science	136
Science Of The Total Environment	130
Food Policy	128
Journal Of Cleaner Production	127
Food Management	125
Tropical Animal Health And Production	121
Ecological Economics	118
Sustainability Switzerland	117
Journal Of Food Science	110
BMC Public Health	106
Canadian Journal Of Agricultural Economics	106
Eurochoices	103
Applied Economic Perspectives And Policy	101

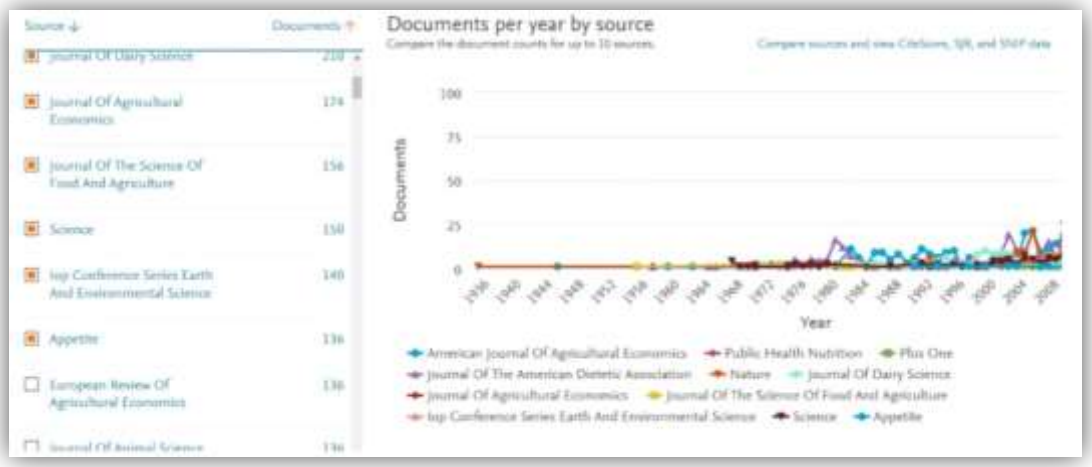

Figure 8.TopJournal wise Publications

Figure 9.Impact of Journal Publication

Figure 10. Impact of Journal Publication

Figure 11. Impact of Journal Publication

Figure 12. Impact of Journal Publication

Subject wise Research Publications

The subject wise publication has been measured as shown table 4.The major subjects are arranged based on the publication output such as Medicine (9615) is the highest position followed by Agricultural and Biological Science (7015), Environmental Science (7073), Social Science (3568) and the rest of the subject field has had below 3 thousand. This analysis seems that most of the experts have represented the medicine related ideas and suggestions that reflected as a top resolutions in Medicine.

8. Funding Sponsors

Generally, in research and development activities, sponsoring body is taking significant contribution part in particularly assisting the financial support, which is reflected clearly, in the figure 8.The 15 more sponsoring organizations are identified as high based on the publication output. Among them, National Institute of Health and National Natural Science Foundation of China are the remarkably supporting in producing more than 200 research publications in the current research area of Food Economics.

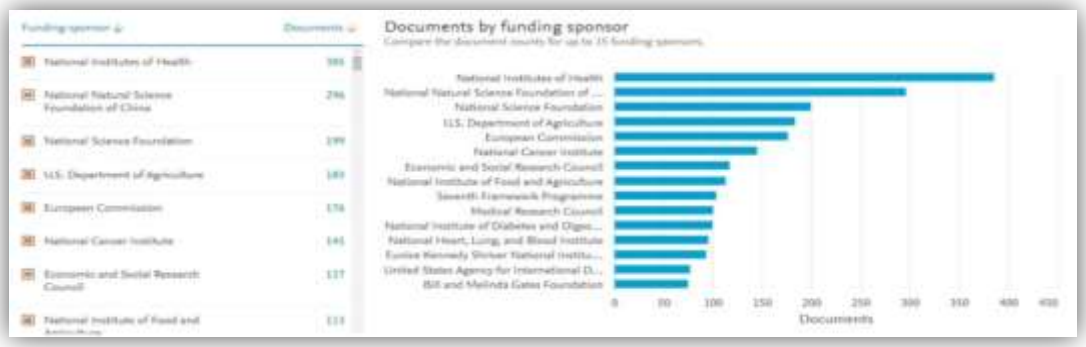

Figure 13.Sponsoring Body

Institutional wise Publication Output

The research publication output of the Institution is demonstrated as shown in figure 9. The top performance in publication research articles only is listed. Washington University & Research (322) is highly dominated comparison with other Institutions. Cornell University, United State Department of Agriculture, Harvard Medical School, and University of California share more than 200 research publications, Davis.4 different Institutions are

recognized by more than 180 research publications that seem as least contribution in this concerned. It is beauty to understand that above said institutions situated in the USA.

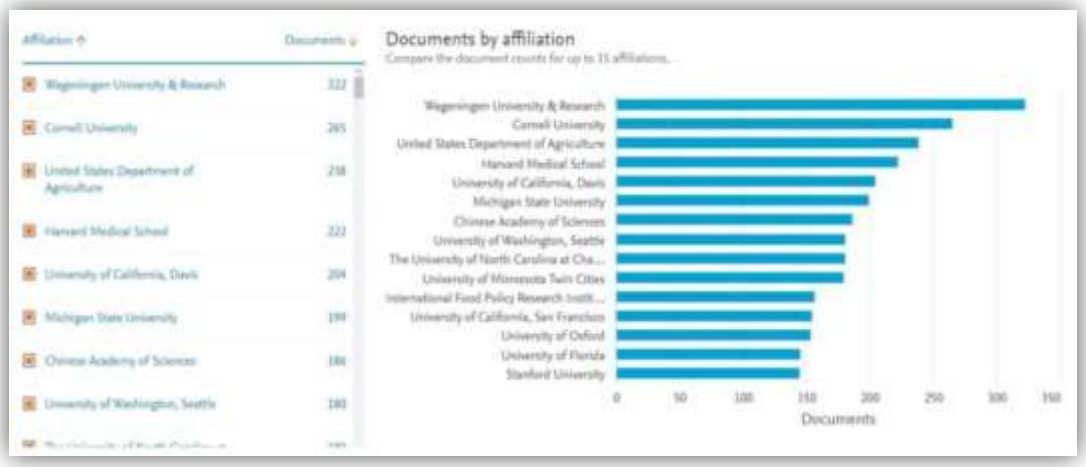

Figure 14.Institutional wise Publication

Finding and Conclusion

Above findings allow to observe the research behavior activities in the field of Food Economics from 1935 to 2021 as of 15th January. The overall observation in the field is that it could be the basis of the future policy system as well as present highlights and possibility to compare the findings from the heterogeneous situational messages and approaches. As far as publications concerned, it is noteworthy to understand that the reason for the meager output in the beginning stage that it might be either in availability of natural health food or non-availability of proper media for disseminating their publications.

The current analysis identified the following issues that the interdisciplinary interest in the field of Food Economics over the period, particularly closely related to public health, sustainable agricultural healthy food, framing public policies that deal with directly for food crises [18], [3], [13].

As explained in the introductory part, many people are in the difficult situation to get healthy food as well as right medicine due to global corona virus since 2019.In the current situation, many research organizations is being involved to frame the vaccine for corona virus in which, some countries have found the medicine, but it doesn't sure hundred percentages in recovering from that disease [17]. Therefore, this study feels that it is not easy in recommendation to world reviewers and experts in terms of the current analysis.

However, at this point, another finding in this analysis that the resourcefulness author of Drewnowski, Kesselheim and Popkini where framed their publications inputs that can be considered in making sustainable growth among the public health. In this context, each developing country's government in the world may turn to special attention to the rural places for cultivating and maintaining the agricultural healthy food that is a special suggestion in the current analysis.

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