

Bibliometric Analysis of Trends Publications in Scopus Databased themed inulin sausages using R Studios

Muhammad Mar'ie Sirajuddin ¹, Syukri Abdullah ², Barry Nur Setyanto ³

¹Food Technology Study Program, Faculty of Industrial Technology, Universitas Ahmad Dahlan, Indonesia

²Institut Sains dan Teknologi AKPRIND, Yogyakarta, Indonesia

³Electronic Engineering Vocational Education, Faculty of Teacher Training and Education, Universitas Ahmad Dahlan, Indonesia

Corresponding Author: muh.sirajuddin@tp.uad.ac.id

ARTICLE INFO

Article history

Received 16/07/2022

Revised 07/08/2022

Accepted 23/08/2022

Keywords

Bibliometric;
Inulin;
Sausage;
R Studios;
Scopus database

 10.12928/jafost.v2i2.6473

ABSTRACT

Inulin is a dietary fiber that can improve the quality of food products, such as texture, product nutrition, or as a disease-preventing functional food. Inulin has begun to be studied in various studies and applied to meat and poultry, but there have not been many studies assessing whether research on the application of inulin to sausage products is still relevant to be carried out and is still good novelist research, one way to assess the novelty of a research theme. Is to use bibliometric analysis. This study examines the publications in the Scopus database from 2001 to 2022 to measure the number of existing publications using the R method. Studied several aspects, namely 1. Annual Scientific Production 2. Most Relevant Author who has researched inulin sausage, 3. Country Production 4. Most Relevant Sources 5. Most Frequent Words 6. Word cloud related to inulin sausage. The results of the bibliometric analysis show that annual scientific publications show that article production growth has increased every year from 2001 to 2022; the highest was in 2019 with 11 articles. The most relevant Author who has written the most publications is Pollonio Mar, with six articles. Brazil is the country that produces the most articles, namely 28 articles, while the most relevant sources are the journal Meat science which produces six articles, and the most frequent words are inulin with 45 occurrences. Conclusions based on the analyzed data, research on inulin in sausages is still limited. And still very worthy of further research.

This work is licensed under a [Creative Commons Attribution-Share Alike 4.0](https://creativecommons.org/licenses/by-sa/4.0/)



1. INTRODUCTION

Inulin is a polyfructan used as prebiotics and a substitute for fat and texture modifiers because of the nutrients and properties of the inulin. Because of its physicochemical properties (Abed et al., 2016). inulin can improve digestive health by reducing the risk of diseases such as constipation, irritable bowel syndrome, inflammatory bowel disease, and colorectal cancer. Inulin can also be used as an attractive prebiotic ingredient in healthier meat formulations, and it can also be used as a fat substitute and dietary fiber enhancer. (Illippangama, Jayasena, Jo, & Mudannayake, 2022).

Inulin has been studied in various studies applied to meat or poultry, such as a substitute for fat or used as a food additive that is used to improve product quality to make it healthier. The resulting product's properties have based on the type of Inulin, the concentration of inulin, and the structure and composition of meat products. Furthermore, inulin can be used in poultry for various purposes such as modifying lipids in food, improving the quality of low-fat meat, enriching fiber, and improving texture and sensory qualities. (Yousefi, Khorshidian, & Hosseini, 2018).

Inulin can also be applied as a food additive used to be meat products such as sausages which can provide benefits such as increasing the emulsion in sausages, one of which is chicken sausage. Some of the benefits of adding inulin are increasing the compactness of the sausage, and others can be used as a substitute for fat, fat content in the product can be decreased by the addition of inulin, besides the addition of inulin can also provide and increase the elasticity of sausage products (Alaei, Hojjatoleslami, & Hashemi Dehkordi, 2018). Previous research has shown that the application of inulin in food has increased over the past ten years (Abed et al., 2016). Therefore, conducting an in-depth analysis of publication trends is necessary, and the latest Research on Inulin in products, especially sausages, is still exciting.

Bibliometric analysis is one of the scientific analyses that can be used for research evaluation, especially in the field of science and applied, which is a method of studying various aspects of science and the way institutions and universities are ranked around the world. (Ellegaard & Wallin, 2015). The bibliometric approach is an analysis carried out to develop scientific fields from the analysis of previous journals or articles selected through the Web of Science, Scopus, Google Scholar, and Semantic Scholar (Winardi, Rohman, Rasyid, Putra, & Dharma, 2022). Bibliometric research is a statistical analysis of articles, books or other publications (Fauzi et al., 2020)

We first need to perform a bibliometric analysis to ascertain the novelty of the research and the amount of research (Derviş, 2019) conducted before we conduct lab-based research using inulin in sausage products. Bibliometric analysis using the R Package software determines research activities on a theme (Derviş, 2019). As a result, this study aims to count the publications on the use of inulin in sausage products and the growth of research trends related to this topic by researchers worldwide using the Scopus database. It will allow us to decide whether or not the research is worthwhile to continue.

MATERIALS AND METHODS

1.1. Materials

The material must be prepared for Software R studio and data imported from the Scopus publication database from 2001 to 2022. The method used refers to the method using bibliometric analysis using the Scopus databased based on keywords (Nooh, 2021).

1.2. Research Methods

Bibliometric analysis is a method used to measure the number of publications. This study shows the trend of publications in the Scopus database about inulin sausage from 2001 to 2022. The initial step of the research begins with finding the right keywords. The keywords used are TITLE-ABS -KEY (sausage AND inulin), then the

data obtained is exported into BibTex form, followed by bibliometric analysis using R studios. Then studied several aspects, namely 1. Annual Scientific Production 2. Most Relevant Author who has researched inulin sausage, 3. Country Production 4. Most Relevant Sources 5. Most Frequent Words 6. Word cloud related to inulin sausage.

2. RESULT AND DISCUSSION

General information obtained through the Scopus database between 2001-2022 was that 267 authors wrote 64 documents, of which the articles consisted of 40 sources in the form of books, journals, etc. Article production growth rate is 6.75% per year. The citation per article is 26.06, the number of keywords used is 503, and the number of references is 2248. The complete primary information can be seen in Table 1.

Annual Scientific Production is a bibliometric analysis of data showing the growth of article production based on a unit of time per year. Annual scientific production data related to the theme of inulin sausage is reviewed every year from 2001 to 2022, and the results are constantly increasing yearly. The highest number occurred in 2019, with 11 publications. The lowest publications occurred in 2010 and 2012, namely 0 articles. The annual Scientific Production graph can be seen in Figure 1.

Figure 1. Main Information data

Main information about data	Value
Document	64
Source (Jurnal, Book, etc.)	40
Average citation per article	26,06
Author	267
Timespan	2001:2022
Document average age	7,97
References	2248
Keywords Plus (ID)	503

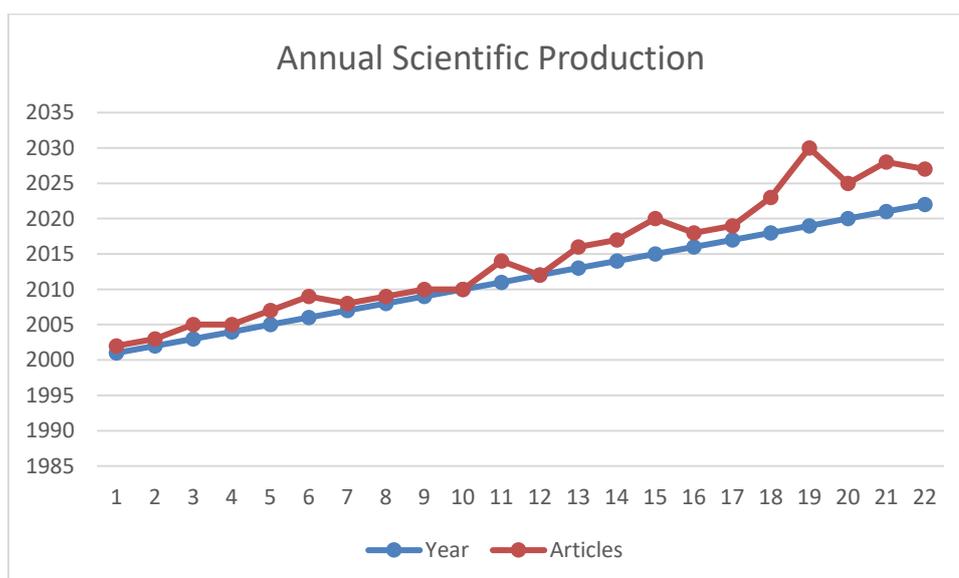


Figure 1. Annual Scientific Production

Most Relevant Author is the result presented in a bibliometric analysis which contains the people who have produced the most work related to a research theme. Based on the results

of bibliometric analysis using R, the Author produced the most publications with the theme of inulin sausage, namely Pollonio Mar with six articles, followed by Vasilev D with four articles and Barreto Acs with three articles. The Top 10 Most Relevant Authors and their number of articles can be seen in Figure 2.

Based on the results of the resulting bibliometric analysis, several were obtained from countries that produced the most articles related to inulin sausage, such as Brazil, Spain, Serbia, Denmark, Germany, Iran, etc. The top 10 Country Production by the article can be seen in Figure 3. Brazil produced the most articles related to inulin sausage, with the highest number of articles, namely 28 articles, followed by Spain and Serbia, which produced 17 and 15 publications, respectively.

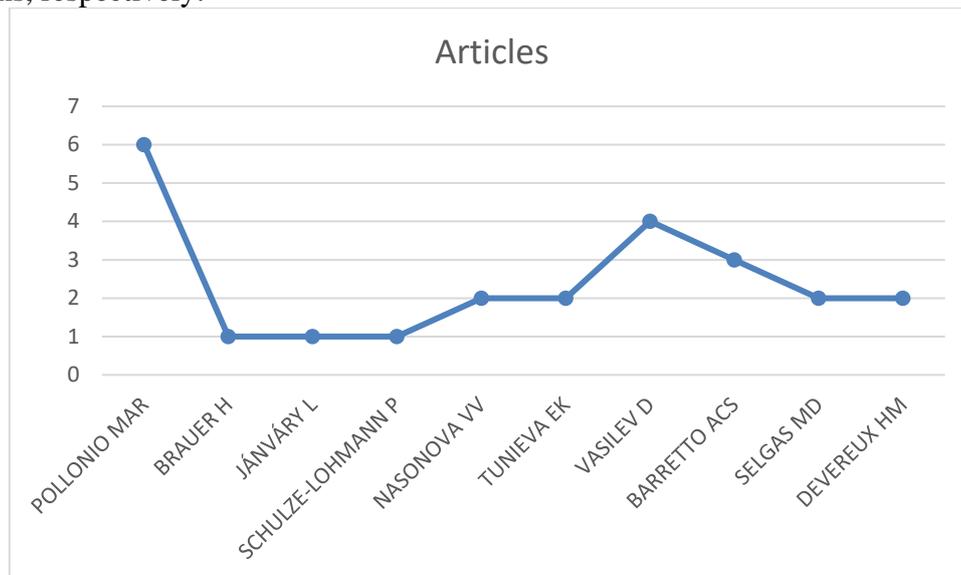


Figure 2. Top 10 Most Relevant Authors by Articles

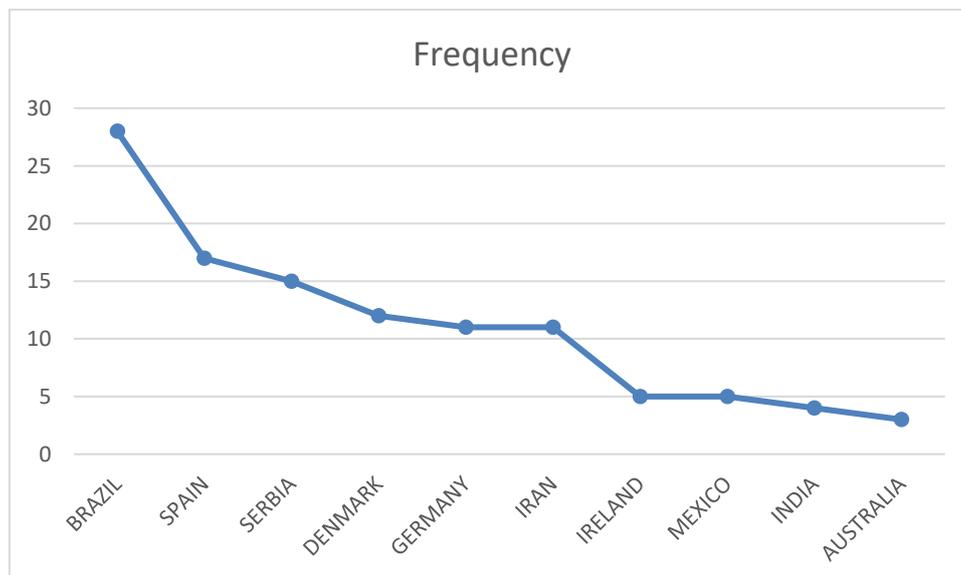


Figure 3. Top 10 Country Production

Most Relevant Sources are journal sources that produce the most articles with a specific theme after being analyzed using R. Based on the results of a bibliometric analysis with the theme of inulin sausage with databased sources from Scopus, the journal results that produce the most articles are Meat Science with articles that have been produced. Namely,

six articles, followed by Fleischwirtschaft with five articles and Lwt with 4. Table 2 presents the Top 10 Frequent Words based on analysis using R.

Most Frequent Word in bibliometric analysis contains the most used words as keywords in scientific papers. Based on bibliometric analysis using R, it was found that the ten most frequently used keywords were in the first place: Inulin with 45 occurrences, meat with 23 occurrences, and meats with 22 occurrences. The following Top 10 Most Frequent Words based on R analysis can be seen in Table 3

Table 2. Top 10 Most Relevant Sources

Journal	Article
Meat Science	6
Fleischwirtschaft	5
Lwt	4
Food Science and Technology (Brazil)	3
International Journal of Food Science and Technology	3
IOP Conference Series: Earth and Environmental Science	3
Food Chemistry	2
Food Science and Technology International	2
Food Structure	2
Foods And Raw Materials	2

Table 3. Top 10 Most Frequent Words

Keywords	Occurrences
Inulin	45
Meat	23
Meats	22
Animals	19
Meat products	19
Polysaccharides	17
Dietary fiber	16
Taste	15
Article	14
Animal	13

Word cloud is a system that visualizes words by highlighting the frequencies of words used in a written text. Using word cloud as an adjunct tool for discourse analysis can help the researcher gain a holistic insight into the critical idea present in a short amount of time (Qeis, 2015). R analysis provides facilities by presenting a viewable word cloud so that readers can see what words are the most dominant and represent the most frequently used keywords. The most frequently used words in R analysis are inulin, meat, and meats. The following Word cloud bibliometric analysis results using R can be seen in Figure 4.



Figure 4. Word cloud

3. CONCLUSIONS

Inulin is a dietary fiber commonly used as a food additive, which can improve the quality of food products such as sausages or other meat products; giving inulin to products can improve product quality such as texture or product nutrition. Inulin is a functional food product that can improve digestive tract health or reduce diseases such as constipation, irritable bowel, or colon cancer. Inulin has been studied in various studies and applied to meat and poultry. Annual scientific production data related to the inulin sausage theme has been reviewed every year since 2001. The results of bibliometric analysis using the R method were carried out to examine inulin sausages on the Scopus database from 2001-2022, and the results showed that the growth of article production was based on units of time per year. It is concluded that publications always increase yearly; the most were in 2019 with 11 articles. The most relevant Author who wrote the most publications was Pollonio Mar, with six articles. Brazil is the country that produces the most articles, namely 28 articles, while the most relevant sources are Meat science journals which produce six articles, and the most frequent words are inulin with 45 occurrences. Conclusions based on the analyzed data, research on inulin in sausages is still limited and still very worthy of further research.

REFERENCES

- Abed, S. M., Ali, A. H., Noman, A., Niazi, S., Ammar, A., Bakry, A. J. I. J. o. A. I., & Research. (2016). Inulin as prebiotics and its applications in food industry and human health; a review. *J International Journal of Agriculture Innovations Research* 5(1), 88-97.
- Alaei, F., Hojjatoleslami, M., & Hashemi Dehkordi, S. M. (2018). The effect of inulin as a fat substitute on the physicochemical and sensory properties of chicken sausages. *J Food science Nutrition*, 6(2), 512-519.
- Derviş, H. (2019). Bibliometric analysis using Bibliometrix an R Package. *J Journal of Scientometric Research*, 8(3), 156-160.
- Ellegaard, O., & Wallin, J. A. (2015). The bibliometric analysis of scholarly production: How great is the impact? *J Scientometrics*, 105(3), 1809-1831.

- Fauzi, M. N. M., Anuar, A. S. A. M., Shuhaimi, I. E., Asmuje, N. F., A'wani Abd Aziz, N. D., & Rahman, T. A. F. T. A. (2020). Bibliometrics Analysis of Research Publications Related to *Sus scrofa domesticus*. *J Sains Insani*, 5(2), 75-81.
- Illippangama, A. U., Jayasena, D. D., Jo, C., & Mudannayake, D. C. (2022). Inulin as a functional ingredient and their applications in meat products. *J Carbohydrate Polymers*, 275, 118706.
- Nooh, M. J. R. t. t. p. s. b. m. a. f. N., MN . . (2021). VUCA: A Bibliometric Analysis of published literatures using R. *GATR Journal of Management and Marketing Review*, 6(4), 222-234.
- Qeis, M. (2015). *Aplikasi wordcloud sebagai alat bantu analisis wacana*. Paper presented at the International Conference on Language, Culture, and Society-ICLCS LIPI.
- Winardi, M. B. S., Rohman, M. C., Rasyid, M. Y. R., Putra, A. A., & Dharma, F. A. (2022). Bibliometric Analysis The Effect of Health Protocol Social Marketing Communications on New Adaptations Covid-19 Pandemic. *J Kanal: Jurnal Ilmu Komunikasi*, 10(1), 13-17.
- Yousefi, M., Khorshidian, N., & Hosseini, H. J. N. (2018). An overview of the functionality of inulin in meat and poultry products. *%J Nutrition Food Science*.