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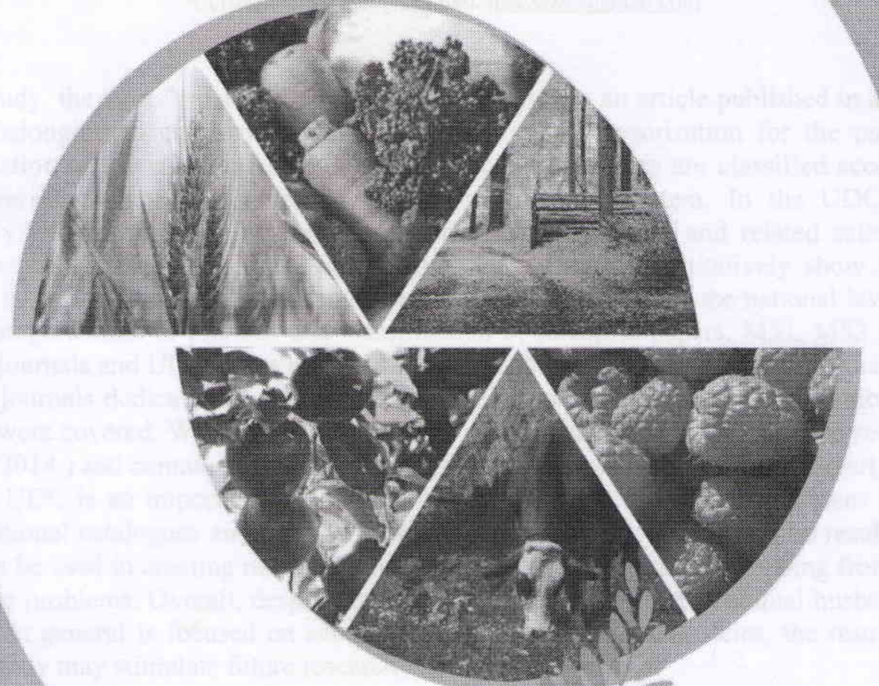

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CLASSIFICATION OF SCIENTIFIC INTEREST IN SERBIAN ANIMAL HUSBANDRY

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Abstract

In this study, the term "a national scientific paper" refers to an article published in a national journal belonging to category M50. In addition to the categorization for the purpose of quantification of scientific and research results, scientific papers are classified according to the Universal Decimal Classification (UDC) scheme and system. In the UDC, animal husbandry and breeding in general are placed under agriculture and related sciences and techniques. Given the above, the aim of this study was to quantitatively show scientific interests in the field of animal husbandry and breeding in general at the national level, based on the categorization of journals and classification of scientific papers. M51, M52 and M53 national journals and UDC codes assigned to published articles were used for the analysis. All national journals dedicated to scientific research that meet the requirements of bibliometric analysis were covered. Within these journals, all articles published in the past few years (from 2009. to 2014.) and containing UDC codes beginning with 636 were analyzed. Apart from the fact that UDC is an important scheme and a highly flexible classification system based on which national catalogues and national bibliographies are being organized, the results of this study can be used in creating new and more complex scientific questions arising from current and future problems. Overall, despite the fact that scientific interest in animal husbandry and breeding in general is focused on economically important animal species, the results of the present study may stimulate future research into neglected areas.

Keywords: *categorization, comparison, livestock rearing, UDC.*

Introduction

Given the concept of science and scientific work as the result of creator's mental activity, classification of scientific interest can be helpful principally to scientists in the earliest period of their creativity. The fact that plant production is the primary determinant of the character of livestock production places special emphasis on the importance of classifying scientific interest in this branch of agriculture.

The preparation of scientific research generally has seven stages, as follows: general introduction to the problem and its setting, collection of scientific materials on the subject being studied, coordination and interpretation of scientific data, hypothesis and the choice of working hypotheses, proving the working hypothesis, drawing conclusions and making recommendations, description of results (Spasic and Milosevic, 2011). Research plan includes the following elements: object of research, funds required for the implementation of research,

research directions, executors of the plan, as well as other important elements for the success of the research team (Veljovic, 2001).

In Serbia there are several publishers of scientific journals of different quality ranks in the field of animal husbandry as a branch of agricultural production. Journal categorization results are published annually on the Ministry of Education, Science and Technological Development website (MPNTR, 2009a, 2010, 2011, 2012, 2013, 2014). The final decision on the categorization of journals that are published in Serbia is passed by the Minister upon proposal of the scientific committee inside the Ministry in charge of research activities (KoBSON, 2001). Category (type) of work may be suggested by reviewers and members of the editorial board or section editors, but the responsibility for categorization shall be borne exclusively by the editor-in-chief (MPNTR, 2009*b*). In order to improve the quality of periodic publishing, the Ministry has passed the Act on Editing Scientific Journals (KoBSON, 2001). Articles in journals are classified into the following categories: scientific articles (original scientific article, review article, short or preliminary communication, scientific critique or controversy and review) and technical articles (technical paper, informative contribution, review) (MPNTR, 2009*b*). National journals are categorized as follows: scientific journals (category M53), journals of national importance (category M52) and leading journals of national importance (category M51) (Official Gazette of the RS, 2016). However, despite the different analyses and reports, little has been said about scientific interest in agricultural science, and even less about its neglected subfields.

Given the above, the aim of this study was to quantitatively show scientific interests in the field of animal husbandry and breeding in general at the national level, based on the categorization of journals and classification of scientific papers.

Materials and Methods

According to the UDC, animal husbandry and breeding in general are placed under agriculture and related sciences and techniques. Animal husbandry and breeding in general are further divided into: domestic equines (636.1), large ruminants (636.2), small ruminants (636.3), pigs (636.4), poultry (636.5), birds (except poultry and game) bred or kept by humans (636.6) dogs (636.7), cats (636.8) and other animals kept by humans (636.9) (*UDC Summary, 2009*). In addition to these divisions, animal husbandry includes the subdivision of special auxiliary subdivision for animal husbandry (636.01/.09). M_{51}, M_{52} and M_{53} national journals and UDC codes assigned to published articles were used for the analysis. All national journals dedicated to scientific research that meet the requirements of bibliometric analysis were covered. Categorization of domestic scientific journals (M50) in biotechnology and agro-industry is available on the Ministry of Education, Science and Technological Development website (MPNTR, 2009a, 2010, 2011, 2012, 2013, 2014) for the period 2009-2014. Given that no journal categorization proposal for 2015 has been published, the analysis presented includes articles published during the abovementioned period. Within these journals, all articles published in the past few years (from 2009. to 2014.) and containing UDC codes beginning with 636 were analyzed. The results of the research were analyzed using ANOVA (Maletic, 2005; Stankovic *et al*., 1990; Spasic *et al*. 2006), as well as their percentage.

Results and Discussion

Based on the annual number of published papers, the results presented in Table 1 show that scientific interest in the field of animal husbandry and animal breeding in general is highest in 2009, followed by 2014. The results for the analyzed period indicate that in 2012 somewhat fewer articles were published at the national level in the field of animal husbandry and animal breeding in general. However, it should be noted that some of the leading journals of national significance (category M51) were verified by a special decision for 2012 (category M24),

based on which they were categorized among journals of international importance in this year (MPNTR, 2009a, 2010, 2011, 2012, 2013, 2014).

Given the results (see Table 1), the difference in UDC classification across years was statistically significant ($F_{(8,45)}$ =15.01, $p \leq 0.01$), which indicates significant differences between scientific interest in animal husbandry and animal breeding in general in the period 2009–2014. However, differences in UDC codes between published articles and journals were statistically non-significant (F_{exp}, $p > 0.05$).

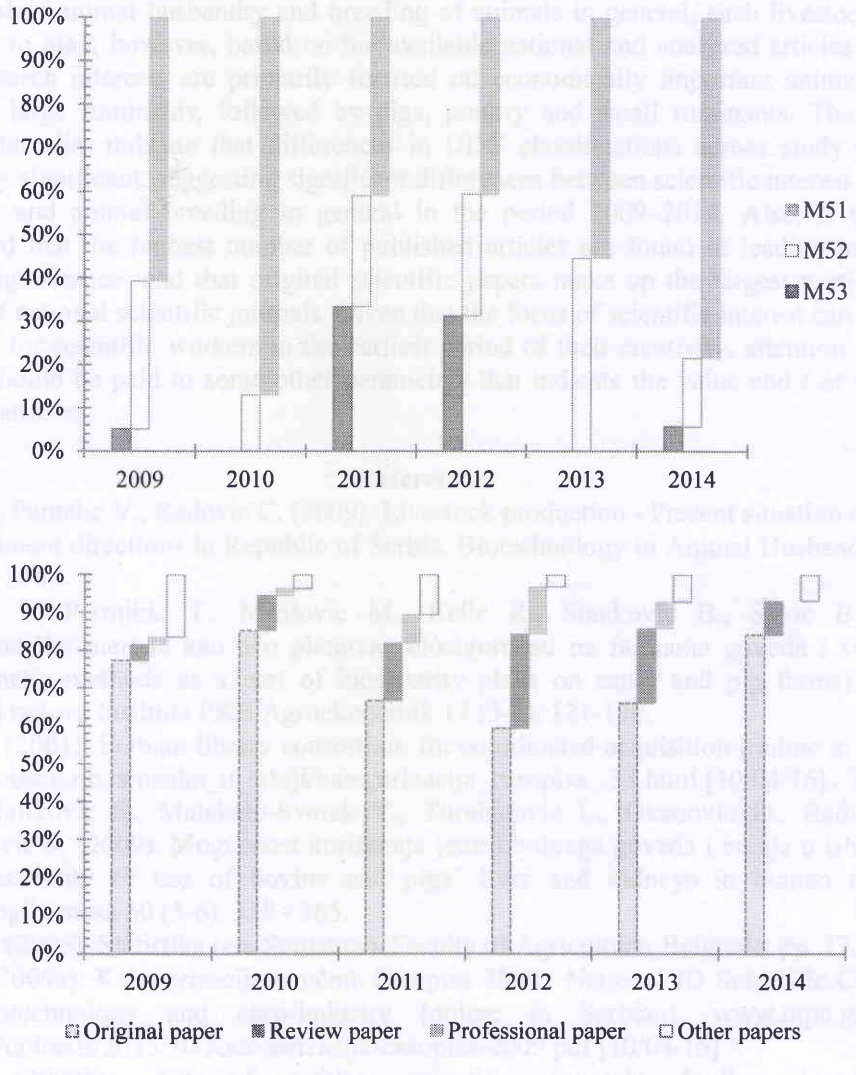
Table 1. ANOVA and percentage values of published articles and journals according to UDC classification and categorization during the period 2009–2014.

Item	Animal husbandry and breeding in general (UDC: 636)								
	636.1	636.2	636.3	636.4	636.5	636.6	636.7	636.8	636.9
Category	$F_{(8,18)}$=2.25, $p > 0.05$								
M51	47.62	55.93	77.78	64.20	67.09	-	42.86	50.00	83.33
M52	33.33	32.20	15.87	29.63	16.46	-	52.38	50.00	0.00
M53	19.05	11.86	6.35	6.17	16.46	-	4.76	0.00	16.67
Total, %	100	100	100	100	100	-	100	100	100
Article	$F_{(8,27)}$=1.06, $p > 0.05$								
Original	61.90	72.88	80.95	77.78	83.54	-	61.90	0.00	50.00
Review	9.52	10.17	11.11	11.11	10.13	-	23.81	0.00	50.00
Professional	4.76	5.08	1.59	6.17	1.27	-	0.00	50.00	0.00
Another	23.81	11.86	6.35	4.94	5.06	-	14.29	50.00	0.00
Total, %	100	100	100	100	100	-	100	100	100
Years	$F_{(8,45)}$=15.01, $p \leq 0.01$								
2009.	19.05	27.12	22.22	19.75	30.38	-	23.81	25.00	16.67
2010.	14.29	18.64	14.29	9.88	10.13	-	14.29	0.00	16.67
2011.	28.57	15.25	14.29	17.28	22.78	-	4.76	0.00	0.00
2012.	4.76	5.93	4.76	11.11	8.86	-	14.29	25.00	16.67
2013.	9.52	16.95	11.11	14.81	13.92	-	14.29	25.00	0.00
2014.	23.81	16.10	33.33	27.16	13.92	-	28.57	25.00	50.00
Total, %	100	100	100	100	100	-	100	100	100
Percentage	5.34 %	30.03 %	16.03 %	20.61 %	20.10 %	-	5.34 %	1.02 %	1.53 %

A desirable and acceptable scientific paper always involves good preparation, research and drawing conclusions, with quality primarily being affected by acquired skills and innovative capacity of researchers. Despite the fact that experienced researchers characteristically show scientific interest in particular disciplines, the results obtained, inter alia, can focus scientific research on neglected animal species and research priorities (see Table 1).

Based on available and analyzed UDC codes in the field of animal husbandry and animal breeding in general, it can be concluded that scientific interest in the period 2009–2014 was focused primarily on large ruminants (30.03%), followed by pigs (20.61%), poultry (20.10%) and small ruminants (16.03%) (see Table 1). Other animal species are not and/or are considerably less dealt with in published articles in the field of animal husbandry and animal breeding in general. Moreover, contemporary scientific literature on agriculture tends towards a higher level of scientific knowledge primarily in under-researched areas, but also towards information of recent date. The results presented (see Table 1 and Graph 1) show that the highest number of published articles are found in leading journals of national importance

(category M51), and that original scientific papers make the highest contribution to the contents of national scientific journals and, hence, account for the largest portion of primary scientific literature (Spasic and Milosevic, 2011).
Results on percentage change as regards national categorization for journals and articles published during 2009–2014 are presented in Graph 1.



Graph 1. Percentage change in national categorization for scientific journals (a) and published articles (b) during the period 2009–2014

Furthermore, in the field of animal husbandry and animal breeding in general, there are some published articles whose UDC code consists only of 636 (Aleksic *et al.*, 2009; Nikiton, 2009; Petrovic *et al.*, 2013; Pusic *et al.*, 2011; Umetsu *et al.*, 2011). There are also papers in the field of animal husbandry and animal breeding in general which addressed different species of animals (Bojkovski *et al.*, 2011; Lilic *et al.*, 2009; Radulovic *et al.*, 2013).
In addition to scientific interest and nature of the research project, potential research teams should be formed in accordance with both the topical area under study and the approach taken. Scientific engagement both in the laboratory and in the field, and computer-related

activities should be specifically determined. In addition to experience in planning, conducting and reporting on research work, properly defined activities of potential team members can lead to the development of advanced skills in a particular field of science, especially when it comes to long-term agricultural experiments.

Conclusion

In the field of animal husbandry and breeding of animals in general, each livestock species has a role to play; however, based on the available national and analyzed articles in recent years, research interests are primarily focused on economically important animal species, especially large ruminants, followed by pigs, poultry and small ruminants. The obtained results, inter alia, indicate that differences in UDC classifications across study years are statistically significant, suggesting significant differences between scientific interest in animal husbandry and animal breeding in general in the period 2009–2014. Also, it should be emphasized that the highest number of published articles are found in leading journals of national significance, and that original scientific papers make up the largest portion of the contents of national scientific journals. Given that the focus of scientific interest can primarily be helpful for scientific workers in the earliest period of their creativity, attention in further analyses should be paid to some other parameters that indicate the value and / or impact of published articles.

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