

Subjects Dealt with in Articles Published by *Revista de Producción Animal* from 2007 to 2012

Florentino Uña Izquierdo*, Roberto Vázquez Montes de Oca*, José A. Bertot Valdés*, Ernesto Piñero de Laosa*, Dayanna Álvarez Rodríguez**

* Faculty of Agricultural Sciences, University of Camagüey, Cuba

** University of Camagüey Editions, Cuba

florentino.una@reduc.edu.cu

ABSTRACT

Research quality and scientific exactness of articles published by *Revista de Producción Animal* from 2007 up to 2012 were discussed. Assessment and evaluation were based upon criteria about type of statistical analysis, experimental design and software, level of complexity, and updating of analytical techniques. The field of investigation, the studied species, the number of authors and their background were also taken into account. Findings evidenced a marked improvement with regards to previous stages; however, higher demands on presentation registers and statistical arbitrament, as well as the need of continuous training on statistical packages and current analytical techniques management are recommended.

Key Words: *research quality and scientific exactness, journal's profile*

INTRODUCTION

Scientific journals are the main instrument to foster the spreading of scientific and technological knowledge in society (Albornoz, 2005). They are important elements within Cuba's global strategy to strengthen its position as a scientific power (Hernández and Ojeda, 2007).

In 1985, three issues of *Revista de Producción Animal* were published in the University of Camagüey, Cuba. It was an attempt to publicize the results from agricultural sciences in the mid and east provinces of the country. The journal managed to survive the harshest years of the so-called Special Period. Currently, it is published twice a year and has international access. Up to 2012, 901 works from local researchers; as well as from other provinces and countries have been published.

To celebrate the Twentieth Anniversary of the first issue, the Editorial Board conducted a study comprising the period 1985-2006, in order to evaluate statistical application, experimental design and software application in the articles (Vázquez *et al.*, 2007). Mainly, it was conducted to know the impact of more than fifty Master and PhD thesis dissertations on sustainable animal production. Eventually, it was possible to take practical measures, as the result from the published papers. Consequently, the aim of this paper is to evaluate the quality and scientific character of the articles in the 2007-2012 period.

MATERIALS AND METHODS

One hundred and sixty articles published in *Revista de Producción Animal* between 2007 and 2012 were evaluated and classified as follows.

- Species (bovine, ovine, birds, swine, pasture, others)
- Profile (handling and feeding, animal health, genetics and reproduction, others)
- Origin of main author (Faculty, CEDEPA, provincial research centers, other universities).
- Application of analytical sciences (yes and no)
- Use of software (yes and no)
- Use of experimental design (yes and no)
- Level of complexity (none, elemental, average and advanced)
- Type of software (SPSS, Systat, others and none)

Level of complexity of the statistical analysis used. The classification criteria for the complexity level of the techniques used are the following:

- None
- Elemental: simple ANOVA, simple linear regression, non-parametric test, T-test, descriptive statistics, comparison of proportions and frequency analysis.
- Classical: variance and covariance analysis models with fixed, random and mixed effects; with or without interactions, using

the GLM procedure available in the software used.

- Advanced: multivariate methods, such as, corresponding factorial analysis, main components, cluster, Manova, and other regression types, like ARIMA models, non-linear, logistic regression and multiple regression in general.
- To evaluate the type of software, descriptive statistics was used (percent analysis).

To determine the dependence relation between variables the Chi-square test was used. In case of not meeting the requisites due to wrong data distribution, the Fisher accurate test was used to corroborate the Chi-square test results. A normality K-S test was used for the number of authors variable. As distribution was not normal, the Krustal-Wallis parametric test (K-individual samples) was used for the following independent variables: author's workplace, topic and animal species. Every statistical analysis was carried out with the SPSS package, version 15 (2006).

RESULTS AND DISCUSSION

Original articles account for 70-80 % of the journal's space, mostly on animal handling and nutrition, animal health, genetics and reproduction. Technical notes are published in the journal as well, in which new feeds, technology transfers, clinical case reports, reviews, and others the Editorial Board considers of general interest. Since its foundation in 1985 to now, 901 documents have been published.

Mesa, Rodríguez and Savigne (2007) have said that assessing is a systematic process that should be based on consistent methodology, in order to determine the validity and reliability of issues. Consequently, between 2007 and 2012, 160 articles were analyzed.

Table 1 shows a significant difference $P < 0.05$ in the number of authors, concerning the species, which is in agreement with Handling and Feeding section (Table 2), where most articles are published. Within the species, ruminants are predominant (Table 3), corresponding to the current objective of the Animal Production Master's Degree.

Considering this issue, Silva (2005) has said there is no net limit to make a distinction between the articles with an acceptable amount of authors, and others with an excess number of authors, be-

cause multiple authors is rather a relative concept. In that context —says Bishop (1984)— it began to gain momentum in the fifties and it is explained, in a great deal by science's natural growth; as well as its progressive complexity and an increase in multidisciplinary team research (Huth, 1982). Although it was not the purpose of this work, it is important to remark that there are five works corresponding to one author per work (3.1 %); between two and five authors, 59.4 %; and more than five authors, 37.5 %. This is important for a university conducting teaching and research tasks, because professors and departments with the greatest number of publications are highlighted. Moreover, the most outstanding departments in science and research have a role in training professionals to socialize with information.

In Table 4, the results from the use of software, analytical techniques, experimental design and level of complexity, are shown.

Vázquez *et al.* (2007) proved that SPSS (Statistical Package for the Social Science) and Systat (Statistical System) were the most commonly used. Now, SPSS accounts for 43.1 %; Systat 16.9 %; other software 18.1 %; and no software use claims 21.9 %.

The application of experimental design was only a small sample in the study. Non-use prevails, especially in the province of Camagüey, which will have to change.

The complexity level was highly significant ($P < 0.001$) in relation with the institution and topics, and concerning the species $P < 0.5$, where the most outstanding institution was the Faculty of Agricultural Sciences, along with CEDEPA. Regarding the topics, genetics and animal production (Table 2) are highlighted, which matches the most frequently studied species (bovines) in table 3.

There is correspondence with Villarreal and Cautin (2004) in that the objectives of assessment of scientific journals are to improve their quality, and measure their social impact from the new knowledge produced. In this stage, it was confirmed that the scientific quality of the article contents is in constant improvement, though there are still difficulties in detecting insufficiencies. Hence, the hard work in reviewing tasks should continue, as the main axis for the journal's team work.

Finally, in reference to Vázquez *et al.* (2007) and the goals achieved in this stage, the Journal of Animal Production has been submitted to assessment by a board or specialists, following CITMA Resolution 59/2003, which systematically evaluates and controls the parameters every scientific journal should meet in Cuba, and be indexed in international scientific databases. It was given ISSN number (224-7920) in its digital version.

CONCLUSIONS

By crossing variable types institution, topic, and species, with the use of software, analytical techniques, experimental design, and level of complexity, significant differences were observed, thus indicating the lack of homogeneity in researcher training in the use of those essential tools to improve the scientific quality of articles.

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Received: 10-6-13

Accepted: 10-7-13

Table 1. Mean ranges achieved in the Kruskal-Wallis test, regarding the number of authors per center, topics and species

No.	Center	Mean range	Topic	Mean range	Species	Mean range
1	Faculty	82.94	Handling and feeding	77.12	Bovine	90.02
2	CEDEPA	81.94	Health	68.83	Ovine	67.70
3	Inv. Cam	84.06	Genetics and reproduction	91.76	Birds	65.17
4	Inv. other Prov.	97.88	Economy and mechanization	78.30	Pigs	80.72
5	Others	49.20	-	-	Others	66.32
Sig.	NS		NS		P < 0.05	

Table 2. Results from the Chi-square test, crossing variable topic with software use, design use, use of analytical techniques and level of complexity

Topic	Software use			Design use			Use of analytical techniques			Level of complexity				
	yes	no	total	yes	no	total	yes	no	total	0	1	2	3	total
Handling and feeding	59	25	84	11	73	84	67	17	84	24	47	8	5	84
Animal health	16	7	23	2	21	23	17	6	23	6	10	6	1	23
Genetics and reproduction	44	4	48	2	46	48	47	1	48	2	19	12	15	48
Economy and mechanization	4	1	5	0	5	5	4	1	5	1	2	2	0	5
Total	123	37	160	15	145	160	135	25	160	33	78	28	21	160
X ²	P < 0.05			NS			P < 0.05			P < 0.001				

Table 3. Results from the Chi-square test crossing variable species with the use of software, design use, use of analytical techniques and level of complexity

Species	Software use			Design use			Use of analytical techniques			Level of complexity				
	yes	no	total	yes	no	total	yes	no	total	0	1	2	3	Total
Bovine	71	15	86	3	83	86	72	14	86	16	35	17	18	86
Ovine	6	4	10	2	8	10	9	1	10	2	7	1	0	10
Birds	10	2	12	4	8	12	11	1	12	2	8	0	2	12
Pigs	15	1	16	1	15	16	15	1	16	1	10	5	0	16
Others	21	15	36	5	31	36	28	8	36	12	18	5	1	36
Total	123	37	160	15	145	160	135	25	160	33	78	28	21	160
X ²	P < 0.05			NS			P < 0.05			P < 0.05				

Table 4. Results from the Chi-square test crossing variable research center with software use, design use, use of analytical techniques and level of complexity

Center	Software use			Design use			Use of analytical techniques			Level of complexity				
	yes	no	total	yes	no	total	yes	no	total	0	1	2	3	total
Faculty	80	15	95	6	89	95	86	9	95	13	47	19	16	95
CEDEPA	10	14	24	1	23	24	13	11	24	13	9	1	1	24
Cent. Inv. Prov.	15	3	18	0	18	18	17	1	18	2	6	6	4	18
Cent. Inv. other prov.	6	2	8	4	4	8	6	2	8	2	6	0	0	8
Others University	12	3	15	4	11	15	13	2	15	3	10	2	0	15
Total	123	37	160	15	145	160	135	25	160	33	78	28	21	160
X ²	P < 0.001			P < 0.001			P < 0.001			P < 0.001				