

ISB-INMA TEH

AGRICULTURAL AND MECHANICAL ENGINEERING

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AGRICULTURAL AND MECHANICAL ENGINEERING

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EFFICIENCY OF USING OF THE ORGANIC MINERAL MIXED LIGAND CU IN THE PIG FEEDING

ЕФЕКТИВНІСТЬ ВИКОРИСТАННЯ ОРГАНІЧНО-МІНЕРАЛЬНОГО ЗМІШНОЛІГАНДНОГО Cu В ГОДІВЛІ СВИНЕЙ

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Keywords: complex organic mineral mixed ligand Cu, crossbreed young pigs, quality of meat

ABSTRACT

Experimental materials with justification of expediency of complex organic mineral mixed ligand Cu using in young pigs rations are presented. Positive effect for the putting of this complex into compound feed of crossbreed young pigs (Large White Landrace pig x Duroc pig) is established, which helps the metabolism and assimilation of nutrients, increases nutritional value of rations, average daily growth of animal and animal productivity.

АНОТАЦІЯ

Представлені експериментальні матеріали обґрунтування доцільності використання комплексу органічно-мінерального змішанолігандного Cu у раціонах молодняку свиней. Встановлено позитивний вплив введення даного комплексу до складу комбікорму помісного молодняку свиней (великої білої х ландрас х дюрок, який сприяє на обмін і засвоєння поживних речовин, підвищення поживності раціонів, середньодобових приростів тварин та продуктивності тварин.

INTRODUCTION

Particular attention is being paid to the problem of increasing the production of competitive meat products with the improvement of quality indexes (Bagchi Debasis, Swaroop Anand, Bagchi Manashi 2015).

Modern animal breeds and crosses require increased macro- and micro- elements in mixed fodders due to a significant increase in growth and productivity (Gonzales-Eguia A., Fu C.-M., Lu F.-Y., & Lien, T.-F. (2009), Khalak V. I., Lunyk Yu. M., 2015).

It is believed that protein, energy, and minerals should be digested in a more accessible form (Dyachenko L. S., Syvyc T. L., Tytariova O. M., Kuzmenko O. A., Bilkevich V. V. 2017).

The value of mineral substances for the normal life of the organism is very difficult to overestimate. However, inorganic salts of transition metals (Zinc, Cuprum, Ferrum, Manganum) due to low digestibility transit and in combination with the concomitant salts of heavy metals pollute the environment (Huang, Y., Zhou, T., Lee, J., Jang, H., Park, J., & Kim, I., 2010; Khavturina A. V., Bomko V.S., 2015; Bomko V.S., Dolid S.V., 2015).

So, traditional approaches to mineral nutrition of farm animals require substantial revision. The analysis of publications confidently attests about the benefits of using microelements from organic compounds in fodder production. This is related primarily with higher bioavailability, which reduces significantly their introduction in the feed mixtures (Merzlov S. V., 2009; Marshalok V. A., Bomko V. S., 2012; Huang, Y. L., Ashwell, M. S., Fry, R. S., Lloyd, K. E., Flowers, W. L., & Spears, J. W., 2015).

Significant reduction of the level of microelements in organic forms of mixed fodders greatly reduces access to heavy metals and improves the quality of livestock products (Liao P., Li M., Li Y., Tan X., Zhao F., Shu X., & Yin Y., 2017).

Cuprum is an important part of the metal proteins which regulates oxidative and reconstructive processes of cellular respiration, photosynthesis, assimilation of molecular nitrogen. As part of hormones Cuprum affects growth and development, reproduction, metabolism in general, processes of gamma globulin formation, promotes the transformation of reticulocytes into mature erythrocytes. Cuprum is required for the formation of melanin pigment, affects the development of bones, and increases the content of vitamins B₁₂ and C in the liver.

The purpose of the research was to study the effectiveness of using the complex organic mineral mixed ligand Cuprum on the quality of pig meat (*Sologub L. I., Antonyak H. L., Stefanyshyn O. M., 2004*).

MATERIAL AND METHOD

Scientific and economic research about the effectiveness of using the complex organic mineral mixed ligand Cuprum in rations of crossbreed young pigs (Large White Landrace pig x Duroc pig) on their meat productivity and qualitative indexes of meat were carried out in the private limited company "Agrofirma named after Horkii" in Dnipropetrovsk region.

To formulate the experiment on the principle of pair-analogues 3 groups of young pigs of 10 heads in each aged 60 days were formed. Animals of the 1st control group received a general diet, which contained of Cuprum in sulfate form. Young pigs of the 2nd experimental group received Cuprum in sulfate form as a part of the general food ration, which was replaced on mixed ligand complex only in 50% and animals of the 3d experimental group received feeding where Cu sulfate was completely replaced by a complex organic mineral mixed ligand Cu. Duration of the experiment was 150 days.

Animals of all experimental groups were kept in the same room and served by one operator. Keeping of pigs were in groups without walking. All experimental animals were clinically healthy. The parameters of the microclimate in the building were supported by the combined extract and input ventilation and conformed to the norms. The animals were fed twice a day, and the drinking was carried out using automatic drinking system.

Ration for young pigs were adjusted depending on age, live weight and intensity of growth and were calculated to obtain average daily increments within 650-700 g. The fodder was of a full value (*Petukhova E. A., Bessarabova R. F., Khaleneva L. D., Antonova O. A., 2010*).

RESULTS

The influence of organic mineral mixed ligand complex on dynamics of live weight of pigs is established. The conducted researches on using in ration of feeding of young pigs the complex organic mineral mixed ligand Cuprum showed that it influenced positively on the live weight of pigs on fattening (Picture 1), (*Melnichenko O. P., Yakymenko I. L., Shevchenko R. L., 2006*).

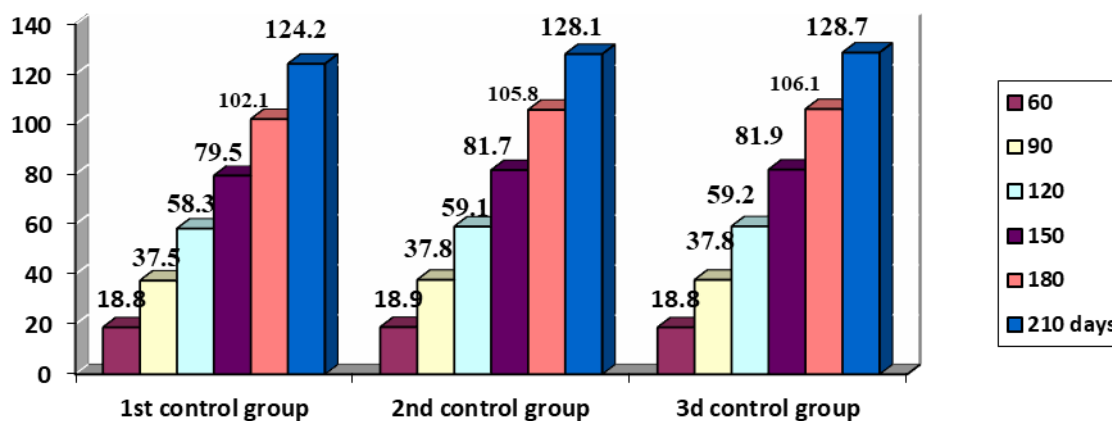


Fig. 1. Dynamics of live weight of experimental pigs, kg

Throughout the period of fattening, the animals of experimental groups exceeded the weight of peers from the control group. By the end of the experiment, the difference in live weight of animals in the 2nd and 3rd experimental groups compared to the control group was 3,9 and 4,5 kg, or 3,14 % ($P < 0,05$) and 3,63 % ($P < 0,01$).

The absolute growth of live weight as a whole during the experimental period in young pigs exceeded control and was in the 2nd experimental group 109.2 kg, in the 3rd experimental group 109.9 kg, which is 3.6% ($P < 0.01$) and 4.2% ($P < 0.001$) higher than control.

During growing, the highest absolute growth of live weight was recorded in experimental groups pigs in the period from 151 to 180 days, which was 24,1 kg in the 2nd experimental group, 24,2 in the 3d experimental group against 22,6 in control. However, it should be noted that in the period from 91-120 days

of fattening there was a significant increasing in the absolute growth in live weight of young pigs of experimental groups.

This indicates a high bioavailability of organic mineral mixed ligand Cu, which activated metabolic processes in the pig's body. And, as a result, the animals of experimental groups exceeded the analogues from the control group for the average daily gain of live weight.

During the experiment, the average daily increment of pigs in the 2nd experimental group exceeded the control on 18,7 g (2,63 %); $P < 0,05$, 3d on 23,4 g (3,29 %); $P < 0,01$. Higher intensity of live weight gain of animals in the experimental groups relative to control was observed throughout the fattening period.

Animals of experimental groups in indexes of relative growth exceeded the analogues from the control group throughout the entire period of breeding. Pigs' growth rates in experimental groups also were higher and made up 6.78 in the 2nd experimental group, 6.85 in the third experimental group, 6.61 in the control group.

Replacing the sulfate compound of Cu in rations of feeding pigs on organic mineral mixed ligand Cu had a positive effect on the growth rate of animals of experimental 2nd and 3rd groups.

The most important indicators of meat productivity are slaughter weight and mass of carcasses. The results of slaughter control showed a positive effect of organic mineral mixed ligand Cu on growth, development and meat productivity of pigs. Before slaughter pigs mass of experimental groups exceeded control on 4,3 kg (3,55 %), $P < 0,05$ and 4,7 kg (3,88 %), $P < 0,01$; mass of carcass on 4,72 kg (6,32 %), $P < 0,01$ and 5,04 kg (6,74 %), $P < 0,001$; slaughter output on 1,42 % ($P < 0,05$) and 1,58 % ($P < 0,05$), and carcass output on 1,65 and 1,7 (Picture 2).

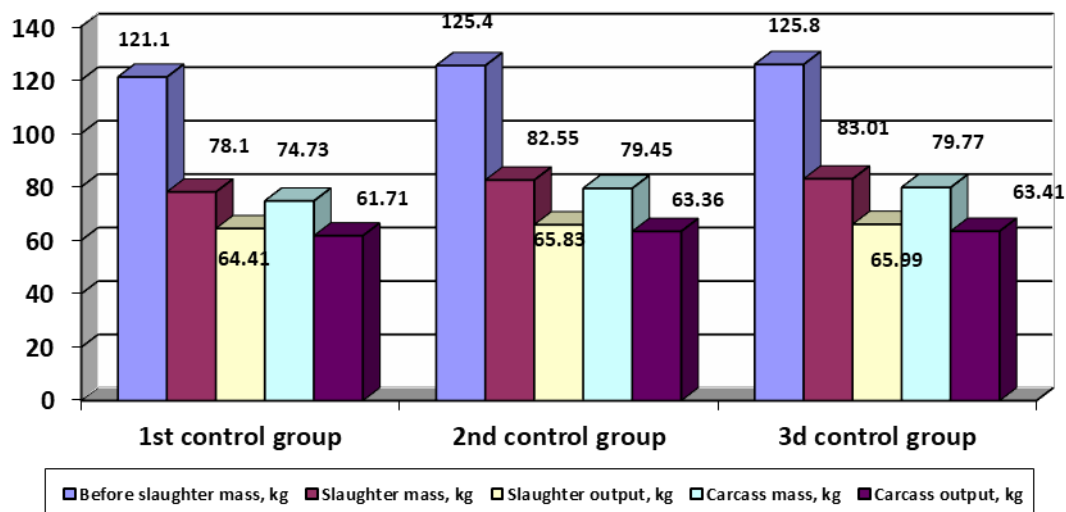


Fig. 2 - Slaughter and meat qualities of experimental animals

The most important method of evaluation, which gives the most complete description of the quality of meat, of its physiological maturity, energetic and biological value, is an analysis of its chemical composition.

The results of a chemical analysis of the average muscle test of carcass found that in comparison with the control dry substance contained in pig meat in 2nd and 3d experimental groups was more on 0,52 ($P < 0,05$) and 0,54 ($P < 0,05$), protein on 0,46 ($P < 0,05$) and 0,48 ($P < 0,05$).

The content of fat in the animals average sample meat compared with control animals revealed no significant differences.

Thus, according to the indexes of the chemical composition of the average sample of meat from the pigs back longest muscle of the carcasses in the experimental groups which received organic mineral mixed ligand Cu in the ration differed profitably from the animals of the control group.

Deeper and more objective information on the meat and lard rates of pigs can be obtained by analyzing the morphological composition of carcasses (table 1). In the first 6 months after birth, the pigs' muscles form in the most intensive way and, accordingly, their relative weight in the body increases. Later, the growth of muscles slows down and fat deposition increases. Therefore, the age of pigs is one of the decisive factors that determines the type of feeding and its success.

The data of experimental butchering of carcasses show that the using the general food ration in fattening pigs in the 1st control group containing Cu all in sulfate form, in pigs feeding of the 2nd

experimental group with the general food ration where Cu sulfate was replaced by only 50% on the mixed ligand complex Cu and animals of the 3rd experimental group, where Cu sulfate was replaced completely by the organic mineral mixed ligand compound of this metal generally contributed an increase in the total amount of lard in carcasses by 0,8-2,2%, and meat - by 0,9-2,8%.

Table 1

Morphological composition of carcasses of experimental animals

Group	Amount of heads	Morphological composition, %			The ratio of meat and lard in the carcass	Coefficient of meatiness
		meat	lard	bones		
1 control	4	61,58	27,34	11,08	1:0,44	5,56
2 experimental	4	60,68	28,11	11,21	1:0,46	5,41
3 experimental	4	58,73	29,59	11,68	1:0,50	5,03

Accordingly, a general tendency was observed for reducing the meatiness coefficient by 0.15 and 0.50 units in accordance with control. Thus, summing up the obtained material, it can be stated that the using of the mixed ligand complex Cu contributed to a steady tendency to increase the slaughtered yield of carcasses and increased the general fattiness of animals, the effect of the mixed ligand complex Cu was most tangible in increasing these parameters in animals of the 3rd experimental group, however the difference in these indicators was not probable.

Replacement in the diet of fattening pigs Cu sulfate, which has an inorganic origin, on organic origin mixed ligand complex Cu had a positive effect on the growth and development of internal organs (table 2).

The results of the experiment on replacing Cu sulfate with Cu chelation showed that these drugs have a positive effect on hematopoiesis and biochemical parameters of metabolism, which leads to increasing of animal productivity and in a certain way affects the mass of individual internal organs. Given that the liver performs functions of secretion of bile, metabolic, antibacterial, anti-toxic, regenerative and other, changes in the mass of this organ of the pigs in the control and experimental groups fluctuated at the level of 0.7-4.4%. There is no reliable difference between the animals.

Table 2

Mass of internal organs of experimental pigs

Index	Groups		
	1 control	2 experimental	3 experimental
Internal fat, kg	1,05±0,12	0,92±0,1	0,82±0,04
Mass of head, kg	5,10±0,34	5,37±0,22	5,75±0,47
Mass of legs, kg	0,84±0,05	0,88±0,03	0,74±0,03
Mass of skin, kg	5,85±0,2	5,38±0,28	5,73±0,26
Liver, kg	1,93±0,11	1,62±0,11	1,78±0,1
Heart, kg	0,25±0,04	0,25±0,02	0,22±0,01
Lungs, kg	0,34±0,05	0,43±0,02	0,37±0,01
Spleen, kg	0,13±0,01	0,11±0,01	0,11±0,01
Stomach, kg	0,73±0,05	0,85±0,02	0,82±0,07

The results of the analysis of heart mass indexes indicate that significant differences between animals in control and experimental groups have not been established.

The results of the determination of the lungs and kidneys mass indicate that there were no significant deviations of the pigs in the control and experimental groups.

It is known that the mass of the spleen increases with increasing of hematopoiesis cells death, and decreases - with the death of cells of the lymph and erythropoiesis. The obtained results of spleen weighing indicate that the average weight of the spleen was the highest in pigs of the 1st group. According to the indicator of the animals of this group, 2.8% of the pigs of the control group prevailed, but this difference was not reliable. Animals of the 2nd and 3rd experimental groups did not differ from the control analogs by the mass of the spleen.

The results of weighing of internal fat showed that its largest mass was fixed in pigs of the 1st group. The weight of the internal organs of the pigs in the experimental groups was at the control level, the difference was not probable.

Thus, the feeding of the organic-mineral additive of Cu in fattening of pigs for meat contributed positively to the slaughter rates of these animals. However, the best slaughter qualities were noted in those animals which diets contained of 100% of mixed ligand complex Cu. By weight of the internal organs of pigs between all groups difference is not observed.

It is known that young pigs produce meat carcasses with less amount of fat than adults. The level and quality of feeding determines the speed of reaching the necessary condition of fattening pigs, feed costs and quality of pork. The more intense the feeding, the faster the fattening ends and the lower feed expense per unit of output is. High levels of protein contribute to the formation of muscles, and significant levels of energy - deposition of fat in the pigs' bodies. The quality of the lard depends on the fat content of the feed. The consumption of significant quantities of vegetable fats by pigs is responsible for the decline in the quality of pork. The fat of such pigs is mild and fusible, unsuitable for smoking. Data on measurements of the subcutaneous layers of fat thickness are given in Table. 3

Table 3

Index	The thickness of the subcutaneous fat, sm		
	Groups		
	1 control	2 experimental	3 experimental
On the neck	3,12±0,11	3,37±0,12	3,17±0,31
On the withers	4,87±0,11	5,92±0,45*	6,1±0,58*
On the 6-7 ribs	3,3±1,12	3,75±0,38	4,07±0,41
On sacrum	3,6±0,3	3,57±0,28	4,25±0,43
On the back	3,12±0,11	3,65±0,18	4,22±0,44
Average	3,6±0,15	4,05±0,28	4,36±0,43

From the data of the table it can be seen that the replacement of sulfur Cu with organic and mineral mixed ligand Cu in feed on 50% and 100% leads to a tendency of increasing the average thickness of lard in pigs of the 2nd group by 12.5%, and the third - by 21.1%, which has a direct correlation with the increasing in the mass of internal fat in carcasses of pigs of experimental groups. The tendency to thicken the lard in the experimental groups occurs at practically all measuring points. A probable difference is observed only on the withers ($P < 0.05$). The obtained data show that the diets with a mixed ligand complex causes the intensification of fat deposition in carcasses.

CONCLUSIONS

Thus, in the results of the control slaughter, the chemical composition of meat, the morphological composition of carcasses, the mass of the internal organs and the thickness of the lard indicate that the young pigs of the 3rd experimental group which received a complex of organic mineral mixed ligand complex Cu had precedence in our studies.

REFERENCES

- [1] Bagchi Debasis, Swaroop Anand, Bagchi Manashi, (2015). Genomics, Proteomics and Metabolomics in Nutraceuticals and Functional Foods. John Wiley & Sons. University of Houston College of Pharmacy, Houston, TX/ USA.
- [2] Bomko V.S., Dolid S.V., (2015), Productivity of young pigs with use of mixed ligand complex Cu. Technology of livestock production, Issue 1, p.p 139-142, Bila Tserkva\ Ukraine.
- [3] Dyachenko L.S., T.L. Syvyc, O.M. Tytariova, O.A. Kuzmenko, V.V. Bilkevich, (2017), Natural detoxicants in pig rations and their impact on productivity and quality of slaughter products. Ukrainian Journal of Ecology, 7 (2), p.p. 239-246, doi: 10.15421/2017_42.
- [4] Gonzales-Eguia A., Fu C.-M., Lu F.-Y., & Lien T.-F. (2009). Effects of nanocopper on copper availability and nutrients digestibility, growth performance and serum traits of piglets. Livestock Science, 126(1), 122-129.
- [5] Huang, Y., Zhou T., Lee J., Jang H., Park J., & Kim I. (2010). Effect of dietary copper sources (cupric sulfate and cupric methionate) and concentrations on performance and fecal characteristics in growing pigs. Asian-Australasian Journal of Animal Sciences, 23(6), 757-761.

- [6] Huang Y. L., Ashwell M. S., Fry R. S., Lloyd K. E., Flowers W. L., & Spears J. W. (2015). Effect of dietary copper amount and source on copper metabolism and oxidative stress of weanling pigs in short-term feeding. *Journal of Animal Sciences*, 93(6), 2948–2955.
- [7] Khalak V. I., Lunyk Yu. M., (2015), Productivity of different breeding values pigs. *Scientific Journal of Gzhytskii Lviv National University of Veterinary and Biotechnology*, Vol. 17, 3 (63), p.p. 330-337.
- [8] Khavturina A. V., Bomko V. S., (2015), Efficiency of feeding of mixed ligand complexes Cu and Zn to Holstein cows. *Technology of livestock production, Bila Tserkva National University of Agriculture*, Issue 1, p.p 199-203, Bila Tserkva\ Ukraine.
- [9] Liao P., Li M., Li Y., Tan X., Zhao F., Shu X., & Yin Y. (2017). Effects of dietary supplementation with cupreous N-carbamylglutamate (NCG) chelate and copper sulfate on growth performance, serum biochemical profile and immune response, tissue mineral levels and fecal excretion of mineral in weaning piglets. *Food and Agricultural Immunology*, 28 (6), 1315-1329.
- [10] Marshalok V. A., Bomko V. S., (2012), Influence of a mixed ligand complex of zinc on the growth and development of Large White pigs on fattening. *Technology of livestock production*, Issue 8, p.p 65-68, Bila Tserkva\ Ukraine.
- [11] Melnichenko O. P., Yakymenko I. L., Shevchenko R. L., (2006), *Statistic working of experimental data*. Bila Tserkva\ Ukraine.
- [12] Merzlov S.V., (2009), Construction of mineral-organic compounds of cobalt and control of the chelating process. *Scientific Journal of Gzhytskii Lviv National University of Veterinary and Biotechnology*, Vol. 11, 2 (41), Part 4, p.p. 172-175.
- [13] Petukhova E. A., Bessarabova R. F., Khaleneva L. D., Antonova O. A. (2010), *Zootechnical analysis of feeds*. St.Peterburg\ Russia.
- [14] Sologub L. I., Antonyak H. L., Stefanyshyn O. M., (2004), The role of copper in the body of animals. *Animal Biology*, Vol. 6, Issue 1-2, p.p. 64-76.

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RESULTS (*Arial 10 pt.*) should be clearly presented. The results should be written in the past tense when describing findings in the authors' experiments. Results should be explained, but largely, without referring to the literature. Discussion, speculation and detailed interpretation of data should not be included in the Results, but should be put into the Conclusions section.

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Formulae, symbols and abbreviations: Formulae will be typeset in Italics (preferable with the Equation Editor of Microsoft Office 2003) and should be written or marked as such in the manuscript, unless they require a different styling. They should be referred to in the text as Equation (4) or e.g. (4). The formulae should be numbered on the right side, between brackets (*Arial 10 pt.*):

$$P = F \cdot v \quad (1)$$

Terms of the equation and the unit measure should be explained, e.g.

P is the power, [W];

F – force, [N];

v – speed, [m/s]

SI units must be used throughout.

Tables should be self-explanatory without reference to the text. The details of the methods used in the experiments should preferably be described in the legend instead of in the text. [The same data should not be presented both in table and graph form or repeated in the text.](#)

Table's title will be typed *Arial 9 pt, Bold, Centered*

In the table, each row will be written Arial 9 pt, single-spaced throughout, including headings and footnotes.

The table should be numbered on the right side, between brackets (*Arial 10 pt*):

Figure (*Arial 9 pt., Bold, Center*) should be typed in numerical order (Arabic numerals). Graphics should be high resolution (e.g.JPEG). Figure number is followed by what represent the figure or graph e.g.:

Fig.1 – Test stand

Legend: *Arial 8 pt, Italic, Center, e.g.*

1 - plansifter compartments; 2- break rolls; 3 – semolina machines; 4 – reduction rolls; 5 – flour

ACKNOWLEDGMENTS (*Arial 10 pt.*) of people, grants, funds etc should be brief (*if necessarily*).

REFERENCES (*Arial 10 pt.*)

(In alphabetical order, in English and in the original publication language).

Minimum 10 references, last 10 years, minimum 3 references from the last 2 years

It can be used “*References*” tool from the *Word Editor*.

References should be cited in the text in brackets as in the following examples:

(Babiciu P., Scripcnic V., 2000)

All references must be provided in English with a specification of original language in round brackets.

Authors are fully responsible for the accuracy of the references.

References should be alphabetically, with complete details, as follows:

Examples:

Books: Names and initials of authors, year (between brackets), title of the book (Italic), volume number, publisher, place, pages number or chapter, ISSN/ISBN:

[1] Vlăduț V., (2009), *Study of threshing process in axial flow apparatus (Studiul procesului de treier la aparatele cu flux axial)*, vol.1, ISSN/ISBN....., “Terra Nostra” Publishing House, Iași/Romania;

Journal Article: Names and initials of authors, year (between brackets), full title of the paper, full name of the journal (Italic), volume number, publisher, place, ISSN, page numbers:

[1] Lizhi Wu, Yan Di., (2005), *Demonstrational study on the land consolidation and rehabilitation (LCR) project of saline-alkali soil in arid areas: a case study of Lubotan LCR project in Pucheng County, Shaanxi Province (干旱区盐碱化土地整理工程实证研究-以陕西蒲城县卤泊滩土地整理项目为例)*, *Transactions of the Chinese Society of Agricultural Engineering*, vol.21, no.1, ISSN , pp.179-182, Madison/Wisconsin;

[2] Leonov I.P., (1973), *Basic machine theory for tobacco stringing. Post-harvest care of tobacco and rustic tobacco*

(Основы теории машин для закрепления табака на шнуры. Послеуборочная обработка табака и махорки), *Collection of scientific articles (сборник научно-исследовательских работ)*, pp.37-45;

Conference or Symposium: Names and initials of authors, year (between brackets), full title of the paper (Regular), full name of the conference/symposium (Italic), volume number, publisher, place, ISSN, page numbers

[1] Bungescu S., Stahl W., Biriş S., Vlăduţ V., Imbrea F., Petroman C., (2009), Cosmos program used for the strength calculus of the nozzles from the sprayers (Program Cosmos folosit pentru calculul de rezistenţă la zgomot al aparatelor de distribuţie), *Proceedings of the 35 International Symposium on Agricultural Engineering "Actual Tasks on Agricultural Engineering"*, pp.177-184, Opatija / Croatia;

Dissertation / Thesis: Names and initials of authors, year (between brackets), full name of the thesis (Italic), specification (PhD Thesis, MSc Thesis), institution, place;

[1] Popa L., (2004), *Research on the influence of structural and functional parameters of the braking system on the braking performance of agricultural trailers (Cercetări privind influenţa caracteristicilor constructive şi funcţionale ale sistemelor de frânare asupra performanţelor de frânare ale remorcilor agricole)*, PhD dissertation, Transylvania University of Braşov, Braşov / Romania.

Patents: Names and initials of authors, year (between brackets), patent title (Italic), patent number, country:

[1] Grant P., (1989), *Device for Elementary Analyses*. Patent, No.123456, USA.

Legal regulations and laws, organizations: Abbreviated name, year (between brackets), full name of the referred text, document title/type (Italic), author, place:

[1] *** EC Directive, (2000), Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000, on the incineration of waste, Annex V, *Official Journal of the European Communities*, L332/91, 28.12.2000, Brussels.

Web references: The full URL should be given in text as a citation, if no other data are known. If the authors, year, and title of the documents are known and the reference is taken from a website, the URL address has to be mentioned after these data:

The title of the book, journal and conference must be written in Italic, the title of the article, chapter of the book, must be written Regular.

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Do not cite references in the abstract and conclusions. Unpublished results, personal communications as well as URL addresses are not recommended in the references list.

Making personal quotations (one, at most) should not be allowed, unless the paper proposed to be published is a sequel of the cited paper. Articles in preparation or articles submitted for publication, unpublished, personal communications etc. should not be included in the references list.

Citations style

Text: All citations in the text may be made directly (or parenthetically) and should refer to:

- **single author:** the author's name (without initials, unless there is ambiguity) and the year of publication: "as previously demonstrated (*Brown, 2010*)".
- **two authors:** both authors' names and the year of publication: (*Adam and Brown, 2008; Smith and Hansel, 2006; Stern and Lars, 2009*)
- **three or more authors:** first author's name followed by "et al." and the year of publication: "As has recently been shown (*Werner et al., 2005; Kramer et al., 2000*) have recently shown....."

Citations of groups of references should be listed first alphabetically, then chronologically.

Units, Abbreviations, Acronyms

- Units should be metric, generally SI, and expressed in standard abbreviated form.
- Acronyms may be acceptable, but must be defined at first usage.

2. SHORT COMMUNICATIONS

Short Communications are limited to a maximum of two figures and one table. They should present a complete study that is more limited in scope than is found in full-length papers. The items of manuscript preparation listed above apply to Short Communications with the following differences: (1) Abstracts are limited to 100 words; (2) instead of a separate Materials and Methods section, experimental procedures may be incorporated into Figure Legends and Table footnotes; (3) Results and Conclusions should be combined into a single section.

3. REVIEWS

Summaries, reviews and perspectives covering topics of current interest in the field, are encouraged and accepted for publication. Reviews should be concise (max. 8 pages). All the other conditions are similar with regular articles.

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