Volume 3, Issue 4 — January — June — 2019

Journal-Urban-Rural and Regional economy

ISSN-On line: 2524-2083

RINOE®

RINOE Journal-Urban-Rural and Regional economy, Volume 3, Issue 4, January – June 2019, is a journal edited semestral by RINOE. La Raza Av. 1047 No.-Santa Ana, Cusco-Perú. Postcode: 11500. WEB: www.rinoe.org, journal@rinoe.org. Editor in Chair: BUJARI - ALLI, Ali. PhD. ISSN: 2524-2083. Responsible for the latest update of this number RINOE Computer unit. ESCAMILLABOUCHÁN Imelda, LUNA-SOTO, Vladimir. PhD, La Raza Av. 1047 No.-Santa Ana, Cusco-Perú. Postcode: 11500, last updated June 30, 2019.

RINOE Journal-Urban-Rural and Regional Economy

Definition of the Journal

Scientific Objectives

Support the international scientific community in its written production Science, Technology and Innovation in the Field of Humanities and Behavioral Sciences, in Subdisciplines of General regional economy: Analysis of growth, Development, and Changes, Size and spatial distributions of regional economic activity, General equilibrium and welfare economic analysis of regional economies, Land use patterns, Econometric and Input-Output models; Household analysis: Housing demand, Other Demand, Regional migration, Regional labor markets, Population; Production analysis and firm location: Housing supply and markets, Other production and pricing analysis, Nonagricultural and nonresidential real estate markets, Input demand analysis, Government policies; Transportation systems: Transportation, Government and private investment analysis, Government pricing; Regional government analysis: Finance in urban and rural economies, Land use and other regulations, Public facility location analysis, Public investment and capital stock, Regional development policy.

RINOE® is a Scientific and Technological Company in contribution to the Human Resource training focused on the continuity in the critical analysis of International Research and is attached to CONACYT-RENIECYT number 1702902, its commitment is to disseminate research and contributions of the International Scientific Community, academic institutions, agencies and entities of the public and private sectors and contribute to the linking of researchers who carry out scientific activities, technological developments and training of specialized human resources with governments, companies and social organizations.

Encourage the interlocution of the International Scientific Community with other Study Centers in Mexico and abroad and promote a wide incorporation of academics, specialists and researchers to the publication in Science Structures of Autonomous Universities - State Public Universities - Federal IES - Polytechnic Universities - Technological Universities - Federal Technological Institutes - Normal Schools - Decentralized Technological Institutes - Intercultural Universities - S & T Councils - CONACYT Research Centers.

Scope, Coverage and Audience

RINOE Journal-Urban-Rural and Regional Economy is a Journal edited by RINOE® in its Holding with repository in Peru, is a scientific publication arbitrated and indexed with semester periods. It supports a wide range of contents that are evaluated by academic peers by the Double-Blind method, around subjects related to the theory and practice of General regional economy: Analysis of growth, Development, and Changes, Size and spatial distributions of regional economic activity, General equilibrium and welfare economic analysis of regional economies, Land use patterns, Econometric and Input-Output models; Household analysis: Housing demand, Other Demand, Regional migration, Regional labor markets, Population; Production analysis and firm location: Housing supply and markets, Other production and pricing analysis, Nonagricultural and nonresidential real estate markets, Input demand analysis, Government policies; Transportation systems: Transportation, Government and private investment analysis, Government pricing; Regional government analysis: Finance in urban and rural economies, Land use and other regulations, Public facility location analysis, Public investment and capital stock, Regional development policy with diverse approaches and perspectives, That contribute to the diffusion of the development of Science Technology and Innovation that allow the arguments related to the decision making and influence in the formulation of international policies in the Field of Humanities and Behavioral Sciences. The editorial horizon of RINOE® extends beyond the academy and integrates other segments of research and analysis outside the scope, as long as they meet the requirements of rigorous argumentative and scientific, as well as addressing issues of general and current interest of the International Scientific Society.

Arbitration Committee

Assignment of Rights

The sending of an Article to RINOE Journal-Urban-Rural and Regional Economy emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Originality Format for its Article.

The authors sign the Format of Authorization for their Article to be disseminated by means that RINOE® In its Holding Peru considers pertinent for disclosure and diffusion of its Article its Rights of Work.

Declaration of Authorship

Indicate the Name of Author and Coauthors at most in the participation of the Article and indicate in extensive the Institutional Affiliation indicating the Department.

Identify the Name of Author and Coauthors at most with the CVU Scholarship Number-PNPC or SNI-CONACYT- Indicating the Researcher Level and their Google Scholar Profile to verify their Citation Level and H index.

Identify the Name of Author and Coauthors at most in the Science and Technology Profiles widely accepted by the International Scientific Community ORC ID - Researcher ID Thomson - arXiv Author ID - PubMed Author ID - Open ID respectively.

Indicate the contact for correspondence to the Author (Mail and Telephone) and indicate the Researcher who contributes as the first Author of the Article.

Plagiarism Detection

All Articles will be tested by plagiarism software PLAGSCAN if a plagiarism level is detected Positive will not be sent to arbitration and will be rescinded of the reception of the Article notifying the Authors responsible, claiming that academic plagiarism is criminalized in the Penal Code.

Arbitration Process

All Articles will be evaluated by academic peers by the Double Blind method, the Arbitration Approval is a requirement for the Editorial Board to make a final decision that will be final in all cases. MARVID® is a derivative brand of ECORFAN® specialized in providing the expert evaluators all of them with Doctorate degree and distinction of International Researchers in the respective Councils of Science and Technology the counterpart of CONACYT for the chapters of America-Europe-Asia- Africa and Oceania. The identification of the authorship should only appear on a first removable page, in order to ensure that the Arbitration process is anonymous and covers the following stages: Identification of the Journal with its author occupation rate - Identification of Authors and Coauthors - Detection of plagiarism PLAGSCAN - Review of Formats of Authorization and Originality-Allocation to the Editorial Board-Allocation of the pair of Expert Arbitrators-Notification of Arbitration -Declaration of observations to the Author-Verification of Article Modified for Editing-Publication.

Instructions for Scientific, Technological and Innovation Publication

Knowledge Area

The works must be unpublished and refer to topics of General regional economy: Analysis of growth, Development, and Changes, Size and spatial distributions of regional economic activity, General equilibrium and welfare economic analysis of regional economies, Land use patterns, Econometric and Input-Output models; Household analysis: Housing demand, Other Demand, Regional migration, Regional labor markets, Population; Production analysis and firm location: Housing supply and markets, Other production and pricing analysis, Nonagricultural and nonresidential real estate markets, Input demand analysis, Government policies; Transportation systems: Transportation, Government and private investment analysis, Government pricing; Regional government analysis: Finance in urban and rural economies, Land use and other regulations, Public facility location analysis, Public investment and capital stock, Regional development policy and other topics related to Humanities and Behavioral Sciences.

Presentation of the Content

In the first chapter we present, *Good practices in agricultural production for environmental conservation and "climate change mitigation" in the Ciénega region of the Jalisco State*, by LOZA-LLAMAS, Juana America, FRÍAS-UREÑA, Héctor Gerardo, MÉNDEZ-MORÁN, Lucila and ROMO-REYES, María Magdalena, as the following article we present, *Quality of wheat flour and oat flour mixes for flour tortilla*, by MORALES-GUZMAN, Víctor, MARTÍNEZ-CRUZ, Eliel and MARTÍNEZ-CRUZ, Rosa Arely, with ascription in the, Universidad Tecnológica de Xicotepec de Juárez, as the following article we present, *Development of a flour for baking based on banana peel (Musa paradisiaca) and chickpea flour (Cicer arietinum)*, by CERÓN-CARRILLO, Teresa Gladys, SANTIESTEBAN-LÓPEZ, Norma Angélica, MORALES-PAREDES, Yesbek Rocío and MALDONADO-RESÉNDIZ, Jorge Ángel, with ascription in the, Benémerita Universidad Autónoma de Puebla, as the following article we present, *Phytoremediation with Eichhornia crassipes and Cyperus papyrus in the Llano Dam in the Municipality of Villa del Carbón, State of Mexico*, by RAZO-PAREDES, Jose Trinidad & TOLEDO-TREJO, Erika, with ascription in the, Universidad Tecnológica Fidel Velázquez.

Content

Article **Journal-Urban-Rural and Regional Economy**
June, 2019 Vol.3 No.4 1-6

Good practices in agricultural production for environmental conservation and "climate change mitigation" in the Ciénega region of the Jalisco State

Buenas prácticas de producción agrícola para la conservación del medio ambiente y "mitigación del cambio climático" en la región de la Ciénega del Estado de Jalisco

LOZA-LLAMAS, Juana America[1]†*, FRÍAS-UREÑA, Héctor Gerardo[1], MÉNDEZ-MORÁN, Lucila[2] and ROMO-REYES, María Magdalena[1]

[1]Departamento de Ciencias Ambientales[2], Departamento de Ecología, [1,2]Centro Universitario de Ciencias Biológicas y Agropecuarias. Camino Ramón Padilla Sánchez No. 2100 Nextipac, Zapopan, Jalisco

ID 1st Author: *Juana America, Loza-Llamas* / **ORC ID**: 0000-0003-1135-0754, **Researcher ID Thomson:** U-1402-2018, **CVU CONACYT ID**: 924239)

ID 1st Coauthor: *Héctor Gerardo, Frías-Ureña* / **ORC ID**: 0000-0002-01784308, **Researcher ID Thomson**: X-3550-2019, **CVU CONACYT ID**: 175277

ID 2nd Coauthor: *Lucila, Méndez-Morán* / **ORC ID**: 0000-0003-4733-6153, **Researcher ID Thomson**: U-1401-2018, **Open ID**: 8418136100, **CVU CONACYT ID**: 121862

ID 3rd Coauthor: *María Magdalena, Romo-Reyes* / **ORC ID**: 0000-0003-1234-0021, **Researcher ID Thomson**: U-1455-2018, **CVU CONACYT ID**: 950190

DOI: 10.35429/JURRE.2019.4.3.1.6 Received March 11, 2019; Accepted June 30, 2019

Resumen

La crisis ambiental que sufre el planeta es originada por múltiples factores, naturales y antropogénicos. En el sector agropecuario se desarrollan actividades que afectan directamente a los recursos naturales. Motivado por esa situación, se realizó el presente trabajo con el objetivo de identificar y promover el uso de buenas prácticas de producción agrícola para la conservación del medio ambiente y mitigación del cambio climático" en la región de la Ciénega del Estado de Jalisco. El trabajo se llevó a cabo en el "Rancho Experimental" propiedad de la Universidad de Guadalajara, ubicado en la localidad de San José Casas Caídas en el Municipio de La Barca, Jalisco. En el trabajo se contó con la participación de 23 productores agrícolas de los municipios de Ocotlán, La Barca y Jamay, del Estado de Jalisco. Un taller participativo fue realizado como estrategia metodológica, donde participaron diferentes actores de la actividad agropecuaria. Como parte de los resultados se identificaron los siguientes problemas: falta de agua, plagas y enfermedades, granizadas, presencia de malezas, ineficiente comercialización, así como la falta de financiamiento. Proponen implementar estrategias de conservación de suelos como; incorporación de residuos de la cosecha, rotación de cultivos, nivelación de suelos, aplicación de compostas, entre otros.

Taller participativo, Buenas prácticas, Conservación del suelo

Abstract

The environmental crisis suffered by the planet is caused by multiple factors, such as the natural and anthropogenic. In agropecuary sector, some activities are developing that directly affect the natural resources. Motivated by that situation, this work was carried out with the objective of identifying and promoting the use of good practices in agricultural production for environmental conservation and "climate change mitigation" in the Ciénega region of the State of Jalisco. The work was carried out in an "Experimental Ranch" of the University of Guadalajara, located in the town of San José Casas Caidas in the Municipality of La Barca, Jalisco. The work included 23 agricultural producers from the municipalities of Ocotlán, La Barca and Jamay, from the Jalisco state. A participatory workshop was held as a methodological strategy, where different actors of the farming activity participated. As part of the results, the following problems were identified: lack of water, pests and diseases, hailstorms, presence of weeds, inefficient commercialization, as well as lack of financing. They propose to implement of soil conservation strategies such as; incorporation of crop residues, crop rotation, soil leveling, application of composts, among others.

Participatory workshop, Good practics, Soil conservation

Citation: LOZA-LLAMAS, Juana America, FRÍAS-UREÑA, Héctor Gerardo, MÉNDEZ-MORÁN, Lucila and ROMO-REYES, María Magdalena. Good practices in agricultural production for environmental conservation and "climate change mitigation" in the Ciénega region of the Jalisco State. Journal-Urban-Rural and Regional Economy. 2019. 3-4: 1-6

† Researcher contributing as first author.

Introduction

Small and large agricultural producers use various productive techniques in their daily practice with the purpose of obtaining efficient results that are reflected in high levels of production yield and product quality. However, when defining the techniques to be used, when the relationship between their agricultural activity and the environment is not taken into account, practices that cause serious damage to natural resources with significant environmental effects are implemented.

Soil is one of the resources that suffers the effects of these practices, according to the information that Bai et. in 2013, 24% of the world's soils show varying degrees of degradation, of which almost half are agricultural soils. In the report presented by FAO (2016), four strategies are proposed to increase food production by minimizing the negative environmental impact.

As a first strategy it is proposed to avoid the loss of productivity due to the degradation of the soil, the second is the closing of the yield gap, which consists in the difference between the yield of the crops observed in one place and the potential yield of the crop in the same place, if best practices and agricultural technologies are applied, the third is to ensure that land use maintains or expands carbon storage in the soil and in biodiversity, by promoting agricultural practices and sustainable land management , and the fourth strategy proposes to increase the efficiency of the use of agricultural inputs such as irrigation, fertilizers and pesticides.

Given this scenario, it is a priority that producers be trained to acquire the necessary tools that not only allow them to improve the yield and / or quality of their production, but that their practice does not cause damage to the environment and contribute to the conservation and mitigation of climate change.

A suitable training model for groups with the characteristics of agricultural producers, as well as obtaining information that serves as a diagnosis of the problem and proposals for improvement, are participatory workshops. Action that involves participants in the development of diagnoses, programs and / or work plans, where together they work to solve common problems (Geilfus, 2002).

This document presents the experience of the work carried out through the participatory Workshop "Use of good agricultural production practices for environmental conservation and climate change mitigation" that was carried out in the Ciénega region of the State of Jalisco, in the municipalities of Ocotlán, La Barca and Jamay.

Objectives

Overall objective

Identify and promote the use of good agricultural production practices for environmental conservation and climate change mitigation "in the Ciénega region of the State of Jalisco.

Specific objectives

1. Identify the conservation and soil management practices carried out by the various actors (agricultural producers, livestock and extension agents) in their activities
2. Know and prioritize the problems faced by producers in the development of their productive practices
3. Strengthen producers' knowledge about the value and importance of the resources that sustain all agricultural activities in the region, in addition to obtaining quick information on natural resources.
4. Feedback on the use of good agricultural production practices for environmental conservation and climate change mitigation

Materials and methods

The work was carried out in the "Experimental Ranch" owned by the University of Guadalajara, located in the town of San José Casas Caidas in the Municipality of La Barca, Jalisco.

There were 23 participants, agricultural producers, from the towns of Ocotlán, Loreto, Jamay, Teocuitatlán and La Barca, of which 19 cultivate corn and the rest sorghum, safflower, wheat, oats and soy. Supported by the Ministry of Rural Development (SEDER) of the State of Jalisco.

ISSN-On Line: 2524-2083

As a methodological strategy for obtaining the results, a participatory workshop was held, entitled "Use of good agricultural production practices for environmental conservation and climate change mitigation" using the methodology of the 80 tools for participatory development de Geilfus (2002), and the guide for facilitators of participatory workshops of the American Agency for International Development (USAID), 2002.

Prior to the workshop, work meetings were held with technicians and officials of the SEDER, in order to agree on the descriptive letter, which includes for each of the 11 scheduled activities: allotted time, topics with their objectives, methodology , the products and responsible. The technicians who participated were those directly involved in the study regions, responsible for convening the different actors in the agricultural sector, as well as participating in the work tables making proposals to enrich the results.

The participatory workshop was developed in three stages: introduction, training and diagnosis of natural resources, as well as feedback to the project "Evaluation of carbon enrichment in the soil of four regions of Jalisco", through the visit to the experimental plots.

Stage 1. Introduction:

At this stage the attendees were registered, the objectives and program of the workshop were presented, in addition to the presentation of the attendees, for this point the dynamic called “Icebreaker” was carried out, so that the participants were known, in where each one presented himself and made a reflection on what he expected at the end of the workshop.

Stage 2. Training and diagnosis on natural resources:

Different techniques were developed to meet the objectives set at this stage. The "brainstorming" dynamic was applied, in order to obtain pertinent and rapid information from the participants on the identification of the natural resources that support the agricultural activity of the region.

The same dynamic was used to identify and describe the practices of conservation and soil management, through a base of questions about who uses the different practices? How do they do it? and why do they do it? The different practices identified classified them in terms of their economic, environmental and social sustainability.

In order to know and prioritize the problems that producers face in the development of their productive practices, this activity was carried out with the support of the double entry identification matrix with the same number of lines and columns as there are problems identified, prioritizing problems.

Stage 3. Feedback to the project through the visit to the experimental plots

The participants were transferred to the experimental area in order to know the effect of the application of various doses of compost in the crops, they were explained that they had six treatments (control, 5, 10, 15 and 20 tons of compost per hectare, as well as 10 tons per hectare of vermiabono) with three repetitions each. Signaling was placed on each of the treatments. They were given a questionnaire to carry out the evaluation of agronomic characteristics of corn cultivation by treatment, where they indicated which was the best and worst. The agronomic characteristics that were taken into account in order to define the best or worst treatments were: height, color, health vigor (disease), acame, number of ears greater than 20 cm., Percentage of filling of the cob, as well as the yield Estimated by treatment. In addition, they were asked if they found differences between treatments and why?

Results

The participatory workshop was held at the “Experimental Ranch” owned by the University of Guadalajara, located in the town of San José Casas Caidas in the Municipality of La Barca, Jalisco.

23 producers participated, from the towns of Ocotlán, Loreto, Jamay, Teocuitatlán and La Barca, grow corn, sorghum, safflower, wheat, oats and soy.

ISSN-On Line: 2524-2083

The dynamic that was developed to promote communication among the attendees was effective, because it facilitated the fulfillment of the established objectives, building an atmosphere of trust and cordiality that helped propose ideas in a group.

The recognition of the natural resources that the region has was the first diagnosis that was made with the assistants, through the question, What are the natural resources that the region has and that are important for agricultural activity? The answer was that there are eight natural resources, which are important to develop their activities, giving priority to water, soil and air. The information collected was reclassified and by the number of mentions, they were grouped into: climate, in which they included temperature, air and temporary first, continuing with the soil and water, and also identifying the flora (vegetation and improved seeds) and fauna (microorganisms), as well as involving the sun. Table 1 lists the natural resources and the number of times they were mentioned as priorities.

Resource	Number of mentions
SUN	1
SOIL (organic matter, minerals)	7
CLIMATE (temperature, air, precipitation)	12
FAUNA (microorganisms)	2
FLORA (vegetation, improved seeds)	2
WATER (temporary)	3

Table 1 Perception of the environment and natural resources of the region

Through plenary presentations, the three-dimensional value of the soil and its interactions, as well as the convenience of enriching the organic matter of the soil, the role of the seeds in the production process, and allowing interaction with Attendees were allowed to extend the information according to the needs regarding the doubts that the participants had.

After reaffirming the importance of the soil as a natural resource that is a priority for the realization of its activities, it was important to know the different activities carried out in the region of La Barca, on the management and conservation of the soil, the actions they perform and how They do them. The results can be seen in table 2.

Different management and conservation practices	How do they do that?
Compost Application	Using bovine excreta
Application of mineral broths	Developing cooking and fermentation processes, in addition to the application of nitrogen in a liquid way
Conservation agriculture	Carrying out direct sowing with precision sowing, incorporation of organic matter (crop remains) is done with a tractor, zero tillage
Ground leveling	According to the slope with laser beams
Incorporation of beneficial microorganisms	It is done to the ground manually or machinery,
Parcel drain	Mechanical or manual form, ditches
Seed inoculation with microorganisms	The seed is prepared with microorganisms (fungi and bacteria). Silicon, sugar and water are added as adherent.
Soil analysis	They take 5 samples per hectare, mix and obtain a sample for delivery to the laboratory and perform the analysis.

Table 2 Soil management and conservation practice

The various actors prioritize the activities of Conservation Agriculture, such as direct sowing, minimum tillage and the incorporation of crop residues, as well as the leveling of soils, drainage of the plots, in addition to the incorporation of beneficial microorganisms.

Once they analyzed the natural resources that the region has, as well as the soil management and conservation practices they perform, it was important to know and prioritize the problems that producers face in the development of their productive practices. The actors were grouped according to the region and formed three groups: Teocuitatlán de Corona and Jamay, the second those of Loreto and La Barca, and the third those that came from Ocotlán. For the first group, the main problems they face are temporary, lack of regional programs, as well as lack of very expensive bank credits or credits. The producers of La Barca and Loreto, for their part, mentioned that the three main problems of the eight they detected are: lack of water, pests and diseases, as well as the presence of weather events such as hailstorms.

ISSN-On Line: 2524-2083

On the other hand, the presence of weeds, poor marketing and lack of financing were three of the main problems mentioned of the eight that they detected.

In addition to the previous activities, the attendees were informed about the project that is being developed for the second consecutive year, highlighting the methodology and results of the 2017 productive cycle. Subsequently, they were invited to visit the experimental plots, in order to carry out the evaluation of the phenological development of corn with the different doses of organic fertilizer used, as well as the performance of the various treatments. It is worth mentioning that the experimental plots presented signage in order to facilitate the activity. The evaluation results are described below.:

The assistants described that the plants that presented greater height were those of the treatment that contains 10 ton of vermiabono per hectare, followed by the plot of 15 tons of compost, the three groups agreed that those of less stature were the plants of the control treatment; in relation to color, they pointed out that the most vivid green could be observed in floods with vermiabono, contrary to those of the witness that showed a yellowish green; the plants considered with greater vigor were those grown with the treatment of 20 tons of compost, followed by the treatments with vermiabono and 15 tons of compost, the opposite were those of the control and 5 tons of compost;

As for the health of the plant, they described that those grown with the treatment of 20 tons of compost were the healthiest, followed by that of 10 of vermiabono that did not present diseases, on the contrary to the most damaged plants were those of the treatment witness; no treatment was presented at any time; the number of ears greater than 20 cm established it as present in those developed with vermiabono and with 20 tons of compost, being lower in the control; the filling of the cob is an important characteristic in the production, which the producers could validate, mentioning that those that were developed with vermiabono have 90 to 95%, followed with 90% those present in the treatment of 20 tons of compost, contrary to the witness with only 70%;

As for the projection of the production yield of ton per hectare, the best qualified was the treatment of 20 tons of compost with a prediction of 5.2 to 7.5 tons, followed by the enriched with vermiabono between 4.5 to 7.5 and the lowest yield was the witness with 3.2 to 4 tons.

Subsequently, producers and technicians were requested, based on their experience, to make feedback proposals to the project, in order to analyze and incorporate them into the project. The proposals they recommended are listed in the following table:

– Schedule sowing taking into account the storm, sow in time
– Sow in the furrow
– Execute drainage lines, in addition to the internal drains of the plot
– Pest trapping
– The ground must be leveled to avoid flooding
– Se debe de considerar a la materia orgánica como un mejorador del suelo
– Incorporar 2000 kilos de composta al momento de la siembra y 150 kilos de triple 17 – Agregar 200 kilos de urea por hectárea, combinando como segunda fertilización
– Agregar lixiviado de lombriz, enriquecido con micro elementos
– Realizar control biológico de plagas, colocando trampas con feromonas (para controlar el adultos del gusano cogollero), dos trampas por hectárea
– Agregar a la siembra 200 kg de silicio por hectárea, mezclada con composta para control de insectos, además le da estructura a la planta

Table 3 Feedback Proposals

Other information that was generated in the workshop, were the proposals of action that should be extended among agricultural producers in the region for soil conservation, indicating six main ones, which are listed in Table 4:

1. Incorporation into the soil of crop residues, shears
2. Perform crop rotation (oats, chickpea, wheat, sorghum, corn, safflower)
3. Perform soil leveling
4. Compost application (M.O.)
5. Apply beneficial microorganisms (Beauveria bassiana is applied to the soil and the plant via foliar, 250 g / 200 L per ha, you can increase the yield for 10 ha, adding 10 kg of flour and 10 l of molasses, you can apply up to on three occasions with intervals of 15 days, with winds less than 10 kilometers per hour, with a type 3 nozzle. Controls buds, mites, suckers, white mosquito
6. Minimum tillage or zero tillage systems.

Table 4 Proposals for soil management and conservation in agricultural production in the region

Conclusions

The natural resources that are present in the region and that are important to develop their agricultural activities are: the climate, in which they included temperature, air and temporary first, continuing with the soil and water, the flora (vegetation and improved seeds) and fauna (microorganisms), as well as the sun.

The various actors prioritize the activities of Conservation Agriculture, such as direct sowing, minimum tillage and the incorporation of crop residues, as well as the leveling of soils, drainage of the plots, in addition to the incorporation of beneficial microorganisms.

The main problems that producers face in the development of their productive practices have been: for Teocuitatlán de Corona and Jamay, they are temporary, lack of regional programs, as well as lack of very expensive bank credits or credits; Loreto and La Barca producers, for their part, mentioned that the three main problems of the eight they detected were: lack of water, pests and diseases, as well as the presence of weather events such as hailstorms; The Ocotlán group have faced the presence of weeds, inefficient commercialization, as well as lack of financing.

The main proposals for feedback to the project were: schedule the planting taking into account the storm, sow in time; sow in the furrow; run drain lines, in addition to the internal drains of the plot; pest trapping; land leveling to avoid flooding and perform biological control of pests.

The proposed actions that should be extended among agricultural producers in the region for soil conservation were: implement minimum tillage or zero tillage systems, such as the incorporation of crop residues and shears into the soil, in addition to the application of composts; perform crop rotation (oats, chickpea, wheat, sorghum, corn, safflower); level the floors; apply beneficial microorganisms (Beauveria bassiana) to the soil and to the plant via foliar.

The capacity of observation of the producers and the empirical knowledge that they develop is very wide, and although they do not perceive the soil as a three-dimensional element, if they perceive it as a finite resource that must be conserved for the sustainability of their activities.

References

Agencia Estadounidense para el Desarrollo Internacional (USAID), (2002). Una guía para facilitadores de talleres participativos que trabajan con ONG´s/OBCs que trabajan en VIH/Sida. Queensbery Hou Internacional HIV/AIDS Alliance. al HIV/AIDS Alliance.

Bai, J., Xiao, R., Zhang, K., Gao, H., Cui, B., & Liu, X. (2013). Soil organic carbon as affected by land use in young and old reclaimed regions of a coastal estuary wetland, China. Soil Use and Management, 29(1), 57-64.

FAO (2016). Estado Mundial del Recurso Suelo, informe 2015. Resumen Técnico. http://www.fao.org/3/a-i5126s.pdf

Geilfus, Frans (2002). 80 herramientas para el desarrollo participativo: diagnóstico, planificación, monitoreo, evaluación – San José, C.R.: IICA,. 217

Article **Journal-Urban-Rural and Regional Economy**
June, 2019 Vol.3 No.4 7-10

Quality of wheat flour and oat flour mixes for flour tortilla

Calidad de mezclas de harina de trigo y harina de avena para tortilla de harina

MORALES-GUZMAN, Víctor†*, MARTÍNEZ-CRUZ, Eliel and MARTÍNEZ-CRUZ, Rosa Arely

Universidad Tecnológica de Xicotepec de Juárez, Área Agroindustrial Alimentaria.

ID 1st Author: *Víctor, Morales-Guzman* / **ORC ID**: 0000-0003-3098-2124, Researcher ID Thomson: S-7585-2018, **CVU CONACYT ID**: 320063

ID 1st Coauthor: *Eliel, Martínez-Cruz* / **CVU CONACYT ID**: 211136

ID 2nd Coauthor: *Rosa Arely, Martínez-Cruz* / **CVU CONACYT ID**: 1012668

DOI: 10.35429/JURRE.2019.4.3.7.10 Received March 01, 2019; Accepted June 30, 2019

Abstract

Wheat grain is the cereal of great importance in the world for its baking characteristics. Oatmeal is a cereal rich in protein value, omega-6 unsaturated fats, insoluble and soluble fiber. The objective of this research was to characterize formulations of wheat flour with oat flour depending on their aptitude for tortillas. The Wheat used is of the UrbinaS2007 variety, treatments of a control were formulated with 100% of Wheat Flour (TE) and three formulations with 5% of Oat Flour(T1), 10% of Oat Flour(T2) and 15% of Oat Flour(T3). A simple Anova was applied with a comparison of tukey mean at P= 0.95. Significant difference was determined in the Sedimentation of TE(Sed)=42.5 mL at T3(TDS)=35.9 mL; alvegraphic parameters Tenacity of TE(P)=42 mm to T3(P)=66 mmH20, Extensibility of TE(L)=63 mm to T3(L)=16 mm, Force of mass TE(W)=70 10E-4J to T3(W) = 48 10E-4J; Mixigrafic of Mixing Time TE(MT)=2.9 min at T3(TA)=2.1 min; Tortilla, Moisture Absorption TE(HA)=44.5% at T3(HA)=46.5%, Protein (TE)Prot=10.4% a (T3)Prot=10.9%. The T3 treatment has desirable characteristics for a wheat flour tortilla.

Soft Wheat, Oat Flour & Extensibility

Resumen

El grano de trigo es el cereal de gran importancia en el mundo por sus características de panificación. La avena es una cereal rico en valor proteínico, grasas insaturadas omega-6, fibra insoluble y soluble. El objetivo de esta investigación fue caracterizar formulaciones de harina de trigo con harina de avena en función de su aptitud para tortilla. El Trigo utilizado es de la variedad UrbinaS2007, se formularon tratamientos testigo con 100% de Harina de Trigo(TE) y tres formulaciones con 5% de Harina de Avena(T1), 10% Harina de Avena(T2) y 15% de Harina de Avena(T3). Se aplicó un Anova simple con una comparación de media de tukey a P=0.95. Se determinó diferencia significativa en Sedimentación de TE(Sed)=42.5 mL a T3=35.9 mL; alvegráma Tenacidad de TE(P)=42 mm a T3(P)= 66 mm, Extensibilidad de TE(L)=63 mm a T3(L)=16 mm, Fuerza de la masa TE(W)=70E-4J a T3(W)=48E-4J; mixográma-Tiempo de Amasado TE(TA)=2.9 min a T3(TA)=2.1 min; tortilla, Absorción de Humedad TE(HA)=44.5% a T3(HA)=46.5%, Proteína (TE)Prot=10.4% a (T3)Prot=10.9%. El tratamiento(T3) posee características deseables para tortilla de harina de Trigo.

Trigo Suave, Avena & Extensibilidad

Citation: MORALES-GUZMAN, Víctor, MARTÍNEZ-CRUZ, Eliel and MARTÍNEZ-CRUZ, Rosa Arely. Quality of wheat flour and oat flour mixes for flour tortilla. Journal-Urban-Rural and Regional Economy. 2019. 3-4: 7-10

* Correspondence to Author (email: victor.morales@utxicotepec.edu.mx)
† Researcher contributing as first author.

Introduction

In the Mexican population, wheat represents the second source of carbohydrates due to its consumption in bakery products of 44.2 kg per capita (CANIMOLT, 2006). The consumption of whole grain foods and their derivatives contributes significantly to healthy nutrition.

Wheat flour tortilla sales in 2015 amounted to 118 thousand tons per year. In the case of wheat flour tortillas, their consumption has historically predominated in the northeast and north of the country and from the participation of the bakery industry through mechanisms of production, distribution and consumer spending has been distributed to practically all the country, so currently its participation in wheat products amounts to 7% of national consumption and 5% of household expenditure. 51% of consumers buy flour tortillas in grocery stores and 23% in self-service stores (CANIMOL, 2016).

Therefore, the objective of this work was to evaluate the quality of the formulations of wheat and oatmeal based on sedimentation tests, rheological mass tests with the mixograph and alveographic and quality tests of baking-tortilla flour.

Developing

In 2018, the annual wheat production in Mexico was 3,139,142 tons with an average yield of 6.03 tons / ha. The annual production of Avena was 13, 147 tons with a yield of 3.24 tons / ha (SIAP-SAGARPA, 2018).

According to Salazar et al. (2000), protein content and quality determines the industrial use of wheat flour; Soft wheat flours with a high protein content (9-11%) are preferably used as raw material for the production of biscuits. The functional quality of wheat protein is determined by the composition of glutenins and gliadins that form gluten. The gliadin fraction contributes to extensibility and cohesiveness (Hoseney, 1991).

Obesity and overweight are current conditions that affect 52% of Mexicans; The costs for care and treatment of associated diseases exceeds 82 billion pesos annually, so the Federal Government has undertaken a series of actions aimed at the prevention and control of such diseases.

Limit the sale of food in schools, installation of school drinking fountains, restrictions on advertising, lien for foods with high caloric content (IEPS), modification of the frontal labeling and nutritional label, campaigns to promote and disseminate physical activities and periodic medical visits , among others (CANIMOL, 2016).

Oatmeal is the only cereal that has significant amounts of lipids in the endosperm, these are characterized by being of high nutritional quality. Oatmeal is characterized by its high fiber content. Oatmeal is the cereal with the highest protein content, although these have functional properties for baking (Hosseney, 1991).

Based on the above, there is a need to promote products that favor the health of the Mexican consumer, so that products based on whole grain oatmeal and wheat flour can be a source of protein of excellent nutritional quality and fiber.

Methodology Developed

The evaluation of the quality of mixtures of refined wheat flour-oatmeal was carried out in the Experimental Field of the Valley of Mexico (CEVAMEX-INIFAP) in the Wheat Quality Laboratory, located at Km 13.5 Los Reyes – Texcoco road, Coatlinchán, Texcoco, State of Mexico. The wheat variety Urbina S2007 was grown under irrigation conditions in the experimental field of Bajío in Roque, Guanajuato during the Autumn-Winter 2017-2018 agricultural cycle. The Turquoise Oat variety was grown under temporary conditions during the spring-summer 2017-2018 cycle; both produced in the Experimental Field of the Valley of Mexico, in Santa Lucia, Coatlinchán, Texcoco, Mexico.

Wheat grain samples were determined the hectolitre weight by the method (AACC-Method 55-10), hardness by the bolting method (AACC Method 55-20), moisture and protein by the FOSS NIR System method (AACC Method 39 -10). Once the wheat was conditioned, it was ground with the Brabender Mill Model 880-200 (AACC Method 26-20). Oat grains underwent threshing, cleaning. Subsequently the oatmeal was dried at 75 ° C for 48 hrs. The milling to obtain flour was done with the Buhuler Wheat Mill. The standard sieve mesh was 0.8 mm.

ISSN-On Line: 2524-2083

From the previously sifted flours, the mixtures were dosed and homogenized on the basis of formulation to assess the ability of flour tortillas. The mixtures that were dosed are the following combinations: 100% Refined Wheat Flour (TE), 5% Oatmeal (T1), 10% Oatmeal (T2) and 15% Oatmeal (T3).

The repetition of the treatment weighs 500 g. The flour mixtures were determined moisture and protein by the near infrared spectrophotometry method, using the automated FOSS NIR System (AACC Method 39-10), sedimentation using the Zeleni method (AACC Method 56-61). The rheological evaluation of the masses was determined by using the 60 g Chopin alveograph using the Alveolink NG software (AACC Method 54-30) and the 10 g mixograph (AACC Method 54-40). Next, the tortillas were prepared evaluating Absorbed Humidity (%), Pre-cooked Tortilla Weight in (g), Tortilla Weight After Cooking (g), Pre-Cooked Tortilla Diameter (cm) and After Cooking Diameter (cm). A sensory analysis was performed with an untrained panel of 30 people. Tortillas made with formulations were evaluated with a preference test based on taste, texture and color. The experimental design was a Simple ANOVA with the 4 treatments of the formulations of wheat flour refined with oatmeal and three repetitions. Comparison test of means was applied by the Tukey test at $P \leq 0.05$ using SAS Sistem version 9.1 software for statistical analysis (SAS, 2002).

Results

Quality characterization of flour mixtures

Table 1 shows the means for the variables of humidity, sedimentation and myxogram.

Mixture	HH (%)	VS (ml)	PROT (%)	TA (min)
TE (100 % HTR)	10.9 a	42.5 a	10.4b	2.9 a
T1 5 % HA	11.0 a	40 b	10.4b	2.8 b
T2 10 % HA	10.9 a	36.6 c	10.6ab	2.2 c
T3 15 % HA	10.9 a	35.9 c	10.9a	2.1 c
HH = moisture in flour (%); VS = sedimentation volume (ml); PROT = Protein; and TA = kneading time (min). Means with different letters in the same column are significantly different (α = 0.05).				

Table 1 Comparison of Moisture, Sedimentation Volume, Protein and Kneading means of mixtures of refined wheat flour (TE) and oatmeal (HA)

The highest sedimentation volume (VS) for the TE (100% HTR) was 42.5 mL coincides with Solís et.al. (2008), while the T3 (15% HA) was the lowest value with 35.9 mL .

Protein content is very similar, it varies from 10.4% in TE to 10.9% in T3. In the case of kneading time (TA), TE presented the highest TA with 2.9 min and the lowest TA3 presented TA = 2.1 min. Table 2 shows the means of the alveographic variables of the mass.

Mixture	P	L	PL	W
TE (100 % HTR)	42[a]	63 a	0.67c	70a
T1 5 % HA	43a	21 b	2.05a	37a
T2 10 % HA	30b	20 b	1.5 b	24[a]
T3 15 % HA	45[a]	27 b	1.67b	36[a]
P = mass tenacity (mm); L = mass extensibility (mm); P / L = tenacity / extensibility ratio (0-7); W = force of the mass (10-4 J). Means with different letters in the same column are significantly different (α = 0.05).				

Table 2 Comparison of means of alveographic variables of refined wheat flour (HTR) and oatmeal (HA) mixtures

Tenacity values varied from 45-30 mm, the highest value being for T3 with P = 45 mm. In the case of extensibility (L), the TE indicated the greatest extensibility L = 63 mm and the T3 was less extensibility L = 7.5 mm. The tenacity / extensibility (PL) ratio varied from 0.67 to 1.67. In the case of mass force (W) no statistical difference between mixtures was detected.

Based on the above, the addition of 5%, 10% and 15% HA in formulations with HRT does not affect the toughness (P) and produces a decrease in the extensibility (L) of the mass, consequently the toughness / Extensibility (PL) increases. The above indicates that Oat protein is inelastic and not extensible. These results agree with Morales et. to the. (2015) who indicated that this behavior is due to the fact that oatmeal does not present the functional gliadin proteins associated in wheat flour due to the extensibility characteristics of the dough, which favor the bread-making characteristics for wheat tortillas (Peña et al .; 2015).

Quality characterization of flour mixtures for Flour Tortilla

Table 3 shows the parameters evaluated to determine flour tortilla quality.

Mixture	HA	PPC	PC	PEC	DPC	DC	PEDC
TE(100% HTR)	44.5b	19.2a	16.5b	13.9a	14.5a	13.7a	1.16b
T1 5 % HA	45.2ab	18.8a	16.7b	11.8b	14.0a	13.1c	2.04ab
T2 10 % HA	45.8a	19.1a	16.7b	12.1b	14.5a	13.6b	2.76[a]
T3 15 % HA	46.5a	19.1a	17.1a	10.3c	14.3a	13.5b	2.52[a]
HA = Absorbed Humidity (%); PPC = Pre-cooked Tortilla Weight (g); PC = Tortilla Cooking Weight (g); PEC = Weight Loss After Cooking (%); DDP = Tortilla Pre-cooking Diameter (cm); DC = Diameter After Tortilla Cooking (g); PED = Loss of Diameter After Cooking (%). Means with different letters in the same column are significantly different (α = 0.05).							

Table 3 Comparison of means of quality variables of tortilla mixtures of refined wheat flour (HTR) and oatmeal (HA)

ISSN-On Line: 2524-2083

According to the functionality evaluation of the flour tortilla samples, the dough indicated a moisture absorption between 46.5% (T3) to 44.5% (TE). There were no significant differences in the variables of Pre-cooked Tortilla Weight (PPC) and DPC Tortilla Diameter. Weight Loss After cooking ranged from 10.3% (T3) to 13.9% (TE). This indicates that the protein and carbohydrates provided by oatmeal favor the retention of water in the product. Loss of Diameter After Cooking was from 2.76% (T2) to 1.16% (TE), which is related to the toughness produced by the inclusion of oat protein in formulations.

The sensory evaluation of an untrained panel of 30 people indicated that flour tortillas made on the basis of treatments do not exist differences. The sensory attributes of taste, texture and color indicated evaluations of likes and likes by the panelists.

Acknowledgments

To the Researchers of the INIFAP-Experimental Field of the Valley of Mexico, Program of Genetic Improvement of Wheat and Oats for the facilities in this study. To the authorities of the UT of Xicotepec for facilitating teacher and student mobility to develop the Research project.

Conclusions

The incorporation of oatmeal (HA) of 5%, 10% and 15% in formulations with refined wheat flour (HRT), decreased the volume of sedimentation (VS), did not change the toughness (P), decreased the extensibility (L) and increase the tenacity / extensibility ratio (PL).

On the other hand, in the range evaluated, the percentage of moisture absorption was higher as the proportion of oatmeal (HA) increased, the percentage of moisture loss of the tortilla after cooking decreased, although the percentage of loss of Tortilla diameter decreased, property related to superior protein content. The inclusion of oatmeal in flour tortilla formulations is functional in the range evaluated. The sensory attributes of the product are similar.

References

American Association of Cereal Chemists (2005). Approved Methods of the AACC, 10th ed. The Association: St. Paul, MN.

CANIMOLT (2006). Cámara Nacional de la Industria Molinera de Trigo. WWW.CANIMOLT.ORG. Julio, 2016.

CANIMOLT (2016). Cámara Nacional de la Industria Molinera de Trigo. WWW.CANIMOLT.ORG. Agosto, 2016.

Hosseney, R.C. 1991. Principios de Ciencia y Tecnología de los cereales. Editorial Acribia. Zaragoza, España. 321 p.

Morales Víctor, Martínez Eliel, Espitia Eduardo y Bardomiano Jaime (2015). Evaluación de calidad de mezclas de harina de avena y harina de trigo para galleta. Revista de Ciencias Naturales y Agropecuarias 2015, 2-4: 608-615.

Peña Bautista, R.J.; Villaseñr Mir, H.E.; Martínez Cruz E.; González Santoyo, H.; Autrique Ruiz, E.; Guzmán, C. (2015). Calidad Industrial de variedades Mexicanas de Trigo Harinero. México, D.F.: CIMMYT.

Salazar, Z. A. (2000). Calidad industrial del trigo para su comercialización. El Trigo de Temporal en México. HE Villaseñor, E Espitia (eds). SAGAR, INIFAP. México. pp, 192-207.

SAS Institute (2002). SAS/STAT User´s Guide: GLM VARCOMP. 6.04. Fourth ed. Cary, NC, USA. pp: 996.

SIAP-SAGARPA (2018). Servicio de información y Estadística Agroalimentaria y Pesquera. Obtenido de la red. www.siap.gob.mx. Diciembre, 2018.

Solís Moya, E., Huerta Espino, J., Pérez Herrera, P., Ramírez Ramírez, A., Villaseñor Mir, H. E., Espitia Rangel, E., & Borodanenko, A. (2008). Urbina S2007: nueva variedad de trigo harinero para la región 'El Bajío'. Agricultura técnica en México, 34(1), 113-118.

ISSN-On Line: 2524-2083

Article **Journal-Urban-Rural and Regional Economy**
June, 2019 Vol.3 No.4 11-16

Development of a flour for baking based on banana peel *(Musa paradisiaca*) and chickpea flour (*Cicer arietinum*)

Desarrollo de una harina para panificación a base de cáscara de plátano (*Musa paradisiaca*) y harina de garbanzo (*Cicer arietinum*)

CERÓN-CARRILLO, Teresa Gladys†, SANTIESTEBAN-LÓPEZ, Norma Angélica, MORALES-PAREDES, Yesbek Rocío and MALDONADO-RESÉNDIZ, Jorge Ángel

Benémerita Universidad Autónoma de Puebla. Facultad de Administración (Gastronomía), Ciudad Universitaria. Puebla, Pue. México

ID 1st Author: *Teresa Gladys, Cerón-Carrillo* / **ORC ID**: 0000-0002-3492-379X, **CVU CONACYT ID**: 211348

ID 1st Coauthor: *Norma Angélica, Santiesteban-López* / **ORC ID**: 0000-0001-7700-4139, **CVU CONACYT ID**: 240825

ID 2nd Coauthor: *Yesbek Rocío, Morales-Paredes* / **ORC ID**: 0000-0003-1740-2682, **CVU CONACYT ID**: 296456

ID 3rd Coauthor: *Jorge Ángel, Maldonado-Reséndiz* / **ORC ID**: 0000-0003-1787-3660

DOI: 10.35429/JURRE.2019.4.3.11.16 Received March 11, 2019; Accepted June 27, 2019

Abstract

The progressive increase in the number of people who cannot consume wheat flour leads the bakery industry to think about the use of different ingredients. In addition to this, there is growing concern about the sustainable use of ingredients for food preparation. The objective of this work is the formation of a flour based on banana peel and chickpea flour. Once the banana peel flour was obtained by drying, grinding and sieving it, a pancake was made by varying the mixture of the two flours (15/85; 20/80; 25/75, 30/70 and 35 / 75% banana flour / chickpea flour), quantifying bread firmness, firm height, weight, moisture, protein, in addition to a sensory evaluation. It is concluded that the mixture with a higher banana peel content has better taste, odor, and texture characteristics than the other preparations. In addition, this flour also has a higher fiber and protein content compared to wheat flour pre-preparation. These types of products help increase sustainability in food preparation as well as improving health due to the nutrients it contains.

Flour, Banana Peel, Sustainability

Resumen

El aumento progresivo del número de personas que no pueden consumir harina de trigo, lleva a la industria panadera a pensar en el uso diferentes ingredientes. Aunado a esto, se encuentra la creciente preocupación por el uso sustentable de ingredientes para la preparación de alimentos. El objetivo del prsente trabajo es la formaulación de una harina a base de cáscara de plátano y harina de garbanzo. Una vez obtenida las harina de la cáscara de plátano mediante secado, molido y tamizado de la misma, se elaboró un panque variando la mezcla de las ambas harinas (15/85; 20/80; 25/75, 30/70 y 35/75 % de harina de plátano/harina de garbanzo), cuantificando la firmeza del pan, la altura firnal, peso, humedad, proteínas, además de una evaluación sensorial. Se concluye que la mezcla con mayor contenido de cáscara de plátano posee mejores características de sabor, olor, y textura que las demás preparaciones. Además esta harina también posee un mayor contenido de fibra y proteínas en comparación con la preapración a base de harina de trigo. Este tipo de productos ayudan a incrementar la sustentabilidad en la preparación de alimentos así como a la mejora de la salud por los nutrientes que contiene.

Harina, Cáscara de plátano, Sustentabilidad

Citation: CERÓN-CARRILLO, Teresa Gladys, SANTIESTEBAN-LÓPEZ, Norma Angélica, MORALES-PAREDES, Yesbek Rocío and MALDONADO-RESÉNDIZ, Jorge Ángel. Development of a flour for baking based on banana peel *(Musa paradisiaca*) and chickpea flour (*Cicer arietinum*). Journal-Urban-Rural and Regional Economy. 2019. 3-4: 11-16

† Researcher contributing as first author.

Introduction

Bread in Mexico is part of a culture and tradition. The bakery arises with the arrival of the Spaniards who introduced the wheat, it was then that the Mexicans turned it into flour, to create dough and produce bakery products with a wide variety of shapes, flavors and names.

The white flour, then, was considered the finest and was for consumption by the viceroys, bishops and other people with high incomes, contrary to this, there was the brown flour used to create the pambazo, name that means low bread, bread for the poor (Barros and Buenrostro, 2009)

The bread is still made with wheat flour, which also provides carbohydrates, proteins for which the bread has its organoleptic characteristics. However, as the number of people suffering from disorders related to gluten content increases, these types of products have become unattainable.

This is why different ingredients have been added to replace wheat and that they are also accepted by the consumer. Examples of these are some starches, cereal and pseudo-cereal flours, hydrcolloids, legumes and proteins. However, many of these products do not have the firmness necessary to generate products with adequate rheological characteristics, so the addition of some flours and emulsifiers is required to improve them (Aguilar et al., 2015).

However, the lack of starch in the preparation of these products has had a negative impact on the consumer's perception, which is why it is necessary to add ingredients such as dietary fiber such as inulin, oligofructose, flaxseed of linseed; in addition to hydrocoyloids used to increase the viscosity of the mass for the retention of gases, thereby improving crumb properties and volume (Pérez-Quirce et al., 2017; Demirkesen et al., 2010)

On the other hand, the innovation and sustainability of food is increasingly seen both in the food industry and in the entrepreneurship of small producers, who have sought the production of food of high nutritional value whose process is friendly to the environment and of minimum

Waste production, likewise, has sought to innovate and experiment with the substitution of ingredients and combination of flavors to create products that arise as alternatives, which are mostly healthier than those commonly known.

Thanks to this it is increasingly common to find a wide variety of alternative products and different components on the market, all designed for the same use; In the bakery industry, products have been developed by replacing flours commonly used with others based on functional foods and / or food wastes for greater fiber intake. Examples of these are the use of orange, pineapple, tangerine, egg and potato peels for fiber enrichment of various products (Ocampo-Olalde et al., 2015; Rosas et al., 2018)

In addition, legume flours, as well as fruit flours, due to their nutritional and fiber content, are ideal alternatives to improve the nutritional quality of bakery products. Legumes, being an important component of the Mediterranean diet, and due to their high nutritional value, have been the subject of study and experimentation of researchers and people seeking product innovation. Legume meal, in addition to having a high nutritional value, is the functional base of products with low protein intake. (Pourafshar et al., 2015; Jarehis et al., 2015).

For this reason, the objective of this work was to formulate a sponge cake made from chickpea flour and banana peel as a more sustainable and gluten-free alternative.

Materials and methods

Materials

Chickpea was compared in a market in the city of Puebla. The banana peel was obtained from an establishment in the city of Puebla. It was also used for the formulation of carboxymethyl cellulose (Deiman, Mexico), sugar (Zulka, Mexico), butter (Chipilo, Mexico), eggs (Tehuacán, Mexico).

ISSN-On Line: 2524-2083

Methodology

Chickpea flour production

The dried seeds of garbanazo were ground using a Nutribullet mill (NTBT600, Mexico) so that the particle will pass through a US sieve no. 50 (300)n) and stored at room temperature (25ºC) in a glass jar.

Banana Peel Flour

The tabasco banana peel was washed and disinfected with a solution with 10 ppm of sodium hypochlorite and then maintained for 20 minutes in a 2% citric acid solution. The shell was then dehydrated in a drying oven (Velaquin model 9053A, Mexico) at 98 ° C for 8 hours. The shell was then milled with a Nutribullet mill until the particle passed through a US sieve no. 50, the flour was stored at room temperature and in a glass jar.

Formulation of sponge cake

The preparation of the cake was carried out by the following process: in a tabletop mixer (Kitchen 5L. Model 5KSM175 Artisan) the butter (100g) was beaten until it had a creamy consistency, 3 egg yolks and 100g of sugar were added until obtaining a creamy and homogeneous mixture, then three egg whites were beaten to nougat, then add the banana flour varying the amount (20, 30, 40 g), chickpea flour (60, 70 and 80 g), Carboxymethylcellulose (7g), baking powder 2g. For the preparation of the control cake, 100 g of wheat hariana and a teaspoon of royal (combination of sodium bicarbonate, tartaric acid and an anti-caking agent) were used and the same process was used. The mixture was divided into 8 molds 5 cm in diameter and 2.3 cm high and baked at 180 ° C for 20 minutes.

Chemical Properties of Flour

Moisture determination was carried out using the gravimetric method using the AOAC 925.10 methodology. The crude protein content was also determined using the Kjeldahl method with the AOAC 2001.11 methodology and multiplying it by a factor of 5.7 to obtain the percentage of proteins, as well as the determination of total fats with the AOAC 31.4.02 methodology.

Physical properties of bread

The weight, volume and volume specific to each bread was determined. An analytical balance was used for weight measurement (Velaquin VE-303). The volume of the bread was measured by placing each piece of bread in a container with known volume and containing millet seeds, the volume of the bread was recorded as the volume displaced by the piece of bread. The specific volume was recorded as the division of the volume by the weight of each piece of bread.

Sensory Bread Evaluation

A hedonic bread test was performed after 12 hours after the pieces were taken out of the oven. Tests were carried out to measure color, smell, taste, texture and acceptability in general. The panelists evaluated the formulations of the breads using a hedonic scale of 7 points, 1 being "extremely disliked" and 7 "Extremely liked"

Statistic analysis

The tests were performed in triplicate. The data obtained were compared using one-way ANOVA using the Minitab v.14 software.

Results and Discussion

The formulations of the different breads were as follows:

Formulation	Chickpea Flour (g)|	Wheat flour (g)	Banana Peel Flour (g)	CMC (g)	Butter (g)	Egg (piece)	Baking Powder (g)	Sugar (g)
1	0	100	0	0	100 g	3	2	100
2	90	0	10	7				
3	80	0	20	7				
4	70	0	30	7				
5	60	0	40	7				
6	90	0	10	4				
7	80	0	20	4				
8	70	0	30	4				
9	60	0	40	4				

Table 1 Formulation of the different types of breads
Source: Self Made

Chemical Properties of Flour

The combination of the two flours has an aspect similar to whole wheat flour and with a slight banana aroma, they also have a more granular appearance than white wheat flour.

ISSN-On Line: 2524-2083

Flour	Proteína (%)	Grease (%)	Humidity (%)
Chickpea	21.76+1.21	7.12+0.87	8.32+0.61
Banana peel	7.34+0.73	4.67+0.89	6.52+0.45

Table 2 Chemical composition of garbanazo flour and banana peel
Source: Self Made

It can be seen that chickpea wheat flour has a higher percentage of protein, fat and moisture than banana flour, however, by incorporating the two flours in a formulation, there are higher concentrations of the three components (Pacheco-Delahaye and Testa, 2005). According to the work done by Gonzalez and Lobo (2010), the antioxidant capacity found in banana peel is higher in relation to the peel of other fruits.

The banana peel also has high water retention capacity values, which proved to be higher compared to the bagasse obtained from other vegetable sources (Grigelmo and Martina, 1999; Alarcon-García, 2003).

Bread Making

The breads made with the standard mixture had an average height of 7 cm and had a golden color, the breads with the banana peel formulation had an intense brown color and a slight banana flavor as well as a more grainy than standard consistency.

When the flour was formed with both the dry ingredients and the wet ingredients, it was observed that the dough had a consistency very similar to the dough made with the wheat flour. However, it was observed that with a greater amount of CMC, the consistency of the dough becomes more viscous.

Below are the results obtained for the different measurements that were made to the bread formulations (Table 3).

Formulation	Weight	Height	Volume	Specific volume
1	72.3+1.3	6.5+0.12	25+2	0.346+0.062
2	73.1+0.8	5.5+0.15	28+3	0.383+0.034
3	73.6+1.1	5.3+0.21	27+3	0.367+0.041
4	73.5+0.9	5.1+0.17	28+2	0.381+0.021
5	74.3+1.5	6.3+0.11	28+1	0.377+0.036
6	74.2+0.6	6.2+0.24	30+1	0.404+0.019
7	75.1+0.2	6.1+0.16	31+2	0.413+0.025
8	76.2+0.1	5.9+0.18	33+2	0.433+0.027
9	76.1+0.3	5.9+0.03	34+1	0.447+0.030

Table 3 Physical properties of bread
Source: Self Made

It can be seen that in terms of weight results, the formulations that had the greatest weight are those that had the highest CMC content due to the retention capacity of the water compound. According to the work done by Wongklom et al. (2016), it was observed that the highest water retention is in breads with carboxymethyl cellulose as water retainer. Similarly, it can be observed that as the carboxymethyl cellulose content increases and the amount of chickpea flour the specific volume increases forming a more compact flour since the soluble fiber of the chickpea acts as a water retainer forming a gel which also It makes it functional for its in the elaboration of other products such as sausages (Sanjeewa, et al., 2010).

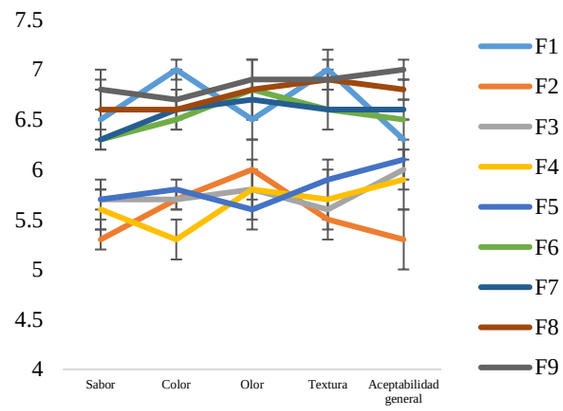
The chickpea (Cicer arietinum), belonging to the Cicereae family, is an annual herbaceous plant. After harvesting, the grains are regularly kept in fresh and ventilated places that favor drying, from which it is possible to convert them into flour, which in the Mediterranean and Indian countries is consumed in combination with pea flour (AEP, 2007). Chickpeas are considered a good source of protein due to their high concentration of free tryptophan (Tavano, da Silva, Demonte and Neves, 2008; Comai, Bertazzo, Costa and Allegri, 2011). Its use in the form of flour as a fortifying ingredient in wheat flour is being considered for the development of new products (Comai et al., 2011).

On the other hand, Agama-Acevedo et al. (2009) prepared different mixtures of banana flour and semolina (15%, 30% or 45% banana flour, taking as a control, 100% semolina), for the elaboration of spaghetti. The total starch content was greater than 45%, presenting lower content of available starch; in addition, it was observed that the content of resistant starch and the non-digestible fraction increased in relation to the amount of banana flour added. Additionally, these researchers showed that the hardness and elasticity of spaghetti were not affected by the addition of banana flour, but the adhesiveness and chewiness increased as the percentage of banana flour in the mixture increased. In addition, the different prepared spaghetti showed no preference differences among consumers (Agama-Acevedo et al., 2009).

ISSN-On Line: 2524-2083

Sensory evaluation

The results of sensory evaluation are as follows (Figure 1)



Graph 1 Results of the sensory evaluation
Source: Self Made

It can be seen that with respect and in comparison with the standard formulation, the formulation with the highest CMC content and those with the highest banana flour content, have similar qualifications, even being in some points higher in the banana flour formulations being This is because the banana flavor conferred by banana peel flour was attractive to most panelists. Therefore, a significant difference ($p < 0.05$) is observed between formulations with different amounts of CMC.

It has been proven in other studies conducted with bread formulation with flours enriched with vegetable or leguminous products have very attractive sensory characteristics for consumers since the added products contain light flavors that go well with any flavoring added to them (Osorio-Díaz, et al., 2008).

References

Abou, E, Helmy, I. y Bareh, G. (2010). Nutritional evaluation and functional properties of chickpea (*Cicer arietinum*, L.) flour and improved produced from its. Journal of American Science, 6(10), 1055-1072.

AEP (European Association for Grain Legume Research). (2007). The amazing lentil. Recuperado el 10 de febrero 2014. http://www.legumefutures.de/images/Grain_legumes_57_Lentils.pdf

Agama-Acevedo, E., Islas-Hernández, J., Osorio-Díaz, P., Rendón-Villalobos, R., Utrilla-Coello R., Angulo, O. y Bello-Pérez, L. (2009). Pasta with unripe banana flour: physical, texture and preference study. *Journal of Food Science*, 74(6), 90-95.

Aguilar, N.; Albanell, E.; Miñarro, B.; Capellas, M. Chickpea and tiger nut flours as alternatives to emulsifier and shortening in gluten-free bread. LWT—*Food Sci. Technol*. 2015, doi:10.1016/j.lwt.2014.12.045.

Bello-Pérez, L., Agama-Acevedo, E., Osorio-Díaz, P., Utrilla, R. y García, F. (2011). Banana and mango flours. En Preedy, V., Watson, R. y Patel, V. B. Flour and breads, and their fortification in health and diseases prevention. (Primera edición, págs. 235-244). San Diego, CA: Elsevier.

Comai, S., Bertazzo, A., Costa, C. y Allegri, G. (2011). Quinoa: protein and non-protein tryptophan in comparison with other cereal and legume flours and bread. En Preedy, V., Watson, R. y Patel, V. B. Flour and breads, and their fortification in health and diseases prevention. (Primera edición, págs. 113-125). San Diego, CA: Elsevier.

Comai, S., Bertazzo, A., Costa, C. y Allegri, G. (2011). Quinoa: protein and non-protein tryptophan in comparison with other cereal and legume flours and bread. En Preedy, V., Watson, R. y Patel, V. B. Flour and breads, and their fortification in health and diseases prevention. (Primera edición, págs. 113-125). San Diego, CA: Elsevier.

Demirkesen, I.; Mert, B.; Sumnu, G.; Sahin, S. Utilization of chestnut flour in gluten-free bread formulations. *J. Food Eng*. 2010, doi:10.1016/j.jfoodeng.2010.07.017.

Guemes-Vera, N., Bernardino-Nicanor, A., González, L., Totosaus-Sánchez, A. 2011. Effect of the addition of orange peel flour on the physicochemical characteristics of the texture profile analysis and sensory in bakery products and sausages. En Vargas D. y Medina, J. Citric Acid: synthesis, properties and applications. Nova Science Publishers, Inc: Reino unido.

ISSN-On Line: 2524-2083

Hefnawy, T., El-Shourbagy, G. y Rmadan, M. (2012). Impact of adding chickpea (C*icer arietinum L*.) flour to wheat flour on the rheological properties of toast bread. International *Food Research Journal*. 19(2), 521-525.

Jahreis, G., Brese, M., Leiter, M., Schafer, U., Böhm, V. 2015. Legume flours: Nutritionally important sources of protein and dietary fiber. Ernahrungs Umschau 63(2):36-42.

Juárez-García, E., Agama-Acevedo, E, Sáyago-Ayerdi, S., Rodrí- guez-Ambriz, S. y Bello-Pérez, L. (2006). Composition, digestibility and application in breadmaking of banana flour. *Plant foods for human Nutrition*, 61, 131-137

Ocampo-Olalde, R., Delgado-Suárez, E.J., Gutierréz-Pabello, J.A. 2015. Harina de cáscara de tuna como fuente de fibra y su efecto sobre las caracaterísticas fisicoquímicas y sensoriales de salchichas bajas en sodio y grasas. NACAMEH, 9(2): 54-65

Osorio-Díaz, P. Agama-Acevedo, E., Mendoza-Vinalay, M., Tovar, J., Bello-Pérez, L.A. 2008. Pasta added with chickpea flour: cemical composition, in vitro starch digestibility and predicted glycemic index. SOMENTA. 6(1):6-12

Ovando, M. (2008). Pasta adicionada con harina de plátano: digestibilidad y capacidad antioxidante. Tesis de maestría no publicada. Instituto Politécnico Nacional, Morelos, México.

Pourafshar, S., RosentrateR, K.A., Padmanahan, G.K. 2015. Using alternative flours as partial replacement of barbari bread formulation *Journal of Food Science and Technology*, 52(9): 5691-5699.

Rosas, R., Goméz, N., Tomás, E., Hernández, A., Dorantes, J.D., García, B., Vázquez, G.A. 2018. Valorización de cáscaras de huevo como suplemento de calcio en pasta tipo Fetuccine. Boletín Científico del Instituto de Ciencias Básicas e Ingeniería, 10: 4-6.

Sanjeewa, W., Wanasundara J., Pietrasik, Z. y Shand, P. (2010). Characterization of chickpea (*Cicer arietum L.)* flour and application in low-fat pork bologna as a model system. Food Research International, 43, 617-626.

Sanjeewa, W., Wanasundara J., Pietrasik, Z. y Shand, P. (2010). Characterization of chickpea (C*icer arietum L*.) flour and application in low-fat pork bologna as a model system. *Food Research International*, 43, 617-626.

Tavano, O., da Silva, S., Demonte, A. y Neves, V. (2008). Nutritional responses of rats to diets based on chickpea (*Cicer arietinum L*.) seed meal or its protein fractions. *Journal of Agricultural and Food Chemistry*, 56, 11006-11010.

.

ISSN-On Line: 2524-2083

Article **Journal-Urban-Rural and Regional Economy**
June, 2019 Vol.3 No.4 17-20

Phytoremediation with *Eichhornia crassipes* and Cyperus papyrus in the Llano Dam in the Municipality of Villa del Carbón, State of Mexico

Fitorremediación con *Eichhornia crassipes* y *Cyperus papyrus* en la Presa del Llano en el Municipio de Villa del Carbón, Estado de México

RAZO-PAREDES, Jose Trinidad[1]*† & TOLEDO-TREJO, Erika[1,2]

[1]*Universidad Tecnológica Fidel Velázquez Av. Emiliano Zapata S/N, el Trafico, 54400 Villa Nicolás Romero, México.*
[2]*División Académica de Ciencias de la Sustentabilidad, División Académica de Ciencias de la Salud*

ID 1st Author: *Jose Trinidad, Razo-Paredes* / **Researcher ID Thomson**: X-3117-2018, **CVU CONACYT ID**: 953362

ID 1st Author: *Erika, Toledo-Trejo* / **ORC ID**: 0000-0002-8444-1879, **CVU CONACYT ID**: 869828

DOI: 10.35429/JURRE.2019.4.3.17.20 Received March 11, 2019; Accepted June 27, 2019

Abstract

The Llano dam is a body of surface water that has been used as a source of water for irrigation and tourist activities such as rowing and fishing tournaments; This dam is located in the municipality of Villa del Carbón in the State of Mexico and there is a history of contamination by enterobacteria and phosphorus (Razo J. et al; 2016). Due to the mentioned importance of this body of water, the objective of this work was to carry out phytoremediation through the use of islands based on recyclable material (PET) and with the plant species Eichhornia crassipes and Cyperus papyrus. The phytoremediation evaluation was performed over a period of three months considering 3 arm, center and curtain sampling zones. The presence of enterobacteria was evaluated as indicators of microbiological contamination and in terms of physicochemical parameters, temperature, dissolved oxygen, pH, hardness, sulfates, nitrates and phosphates were evaluated. The microbiological results showed absence of enterobacteria in the central area of the body in the last sampling, it should be noted that the behavior of the physicochemical parameters is very variable, the values of nitrates and phosphates are related to the presence of enterobacteria, when modified it has an effect on the microorganisms mentioned above. It is important to note that the lack of environmental education in both site administrators and visitors affected the efficiency of the islands as they were moved to the banks of the dam reducing the contact of the phytoremediation islands with water.

Phytoremediation, Plain prey, Enterobacteria

Resumen

La presa del Llano es un cuerpo de agua superficial que ha sido utilizada como fuente de agua para riego y actividades turísticas como remo y torneos de pesca; dicha presa se encuentra ubicada en el municipio de Villa del Carbón en el Estado de México y existe antecedente de contaminación por enterobacterias y fósforo (Razo J. *et al*; 2016). Debido a la importancia mencionada de este cuerpo de agua el objetivo de este trabajo fue realizar fitorremediación mediante el uso de islas a base de material reciclable (PET) y con las especies vegetales *Eichhornia crassipes* y *Cyperus papyrus.* La evaluación de la fitorremediación se realizó en un periodo de tres meses considerando 3 zonas de muestreo brazo, centro y cortina. Se evaluó la presencia de enterobacterias como indicadores de contaminación microbiológica y en cuanto a parámetros fisicoquímicos se evaluó la temperatura, oxígeno disuelto, pH, dureza, sulfatos, nitratos y fosfatos. Los resultados microbiológicos mostraron ausencia de enterobacterias en la zona centro del cuerpo en el último muestreo, cabe señalar que el comportamiento de los parámetros fisicoquímicos es muy variable, los valores de nitratos y fosfatos están relacionados con la presencia de enterobacterias, al modificarse tiene efecto sobre los microorganismos antes mencionados. Es importante señalar que la falta de educación ambiental tanto en los administradores del lugar como de los visitantes afecto la eficiencia de las islas ya que eran movidas a las orillas de la presa disminuyendo el contacto de las islas de fitorremediación con el agua.

Fitorremediación, Presa del llano, Enterobacterias

Citation: RAZO-PAREDES, Jose Trinidad & TOLEDO-TREJO, Erika. Phytoremediation with *Eichhornia crassipes* and Cyperus papyrus in the Llano Dam in the Municipality of Villa del Carbón, State of Mexico. Journal-Urban-Rural and Regional Economy. 2019. 3-4: 17-20

* Correspondence to Author (email: jose.razo@utfv.org.mx)
† Researcher contributing as first author.

Introduction

Three quarters of the Earth is covered by water, 97.5% is salty as part of seas and oceans, 2.5% is fresh water, of which only 0.3% is located in lakes and rivers where man takes most of the water he uses. , the rest is found in glaciers, polar ice caps and underground deposits. In Mexico there are more than 4,462 dams; 667 of them are considered large due to their storage capacity (INEGI, 2019). Mexico occupies the 35th place worldwide in storage capacity per capita (CNA, 2017).

The place of interest to study this work is the Llano dam, which is a body of surface water that has been used as a source of water for irrigation, fishing tournaments, etc. (Razo, J. et al 2016), this It is located in the municipality of Villa del Carbón in the state of Mexico. In 2016, this work group - Razo, J. and collaborators - conducted a study in this dam finding contamination by enterobacteria and for which water treatment was suggested to reduce pollution and so this dam will continue to be useful for the different activities in those that are realized; So then to your goal.

The useful technique that we consider can help decontaminate this body of water is phytoremediation, since it would be cheap, it would not impact the landscape value while they are being implemented in the dam and it is a technique reported as useful for different pollutants. Phytoremediation is a set of technologies that reduce in situ or ex situ the concentration of various compounds from biochemical processes carried out by the plants and microorganisms associated with them, removing, reducing, transforming, mineralizing, degrading, volatilizing or stabilizing pollutants (Kelley et al., 2000; Miretzky et al., 2004; Cherian and Oliveira, 2005; Eapen et al., 2007; Cho et al., 2008).

Of the plants used in phytoremediation, a wide diversity of species that are used for this purpose have been identified, among which we find Eichhornia crassipes and Cyperus papyrus, these species have been reported as efficient in reducing organic matter (Martelo, J. et to 2012). The objective of this work was to implement islands with Eichhornia crassipes and Cyperus papyrus for phytoremediation of the water of the Llano Dam in Villa del Carbón.

Methodology to be developed

ISLAND DESIGN: The following materials will be used for the design of the islands; plastic bottles (preferably of a single size), raffia for industrial use, fiberglass mesh, polyduct, silicone, plants (water lily and papyrus) that will absorb the contaminants. Figure 1,2 and 3. The dimensions and design of the island were made of an island size 2m x 2m, distributed in the areas as shown in figure 4

Figure 1 Phytoremediation Islands

Figure 2 Phytoremediation Islands

Figure 3 Phytoremediation Islands

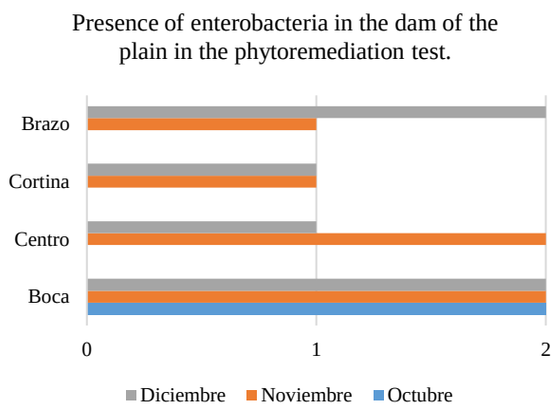
ISSN-On Line: 2524-2083

Figure 4 Distribution of the islands by INEGI zone

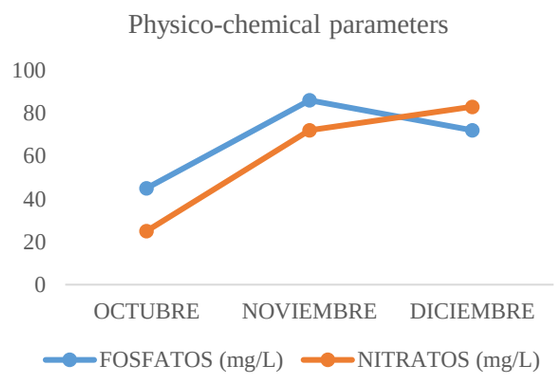
Results

The results of the presence of enterobacteria at the 4 sampling points during the month of October, November and December, in which the islands were tried with Eichhornia crassipes and Cyperus papyrus for Phytoremediation are presented in figure 1. The bacteria were maintained. present throughout the sampling, coincides with the increase in phosphates and nitrates in those periods and sampling areas as can be seen in graph 2 of chemical parameters, phosphorus and nitrogen favor the growth of microorganisms acting as nutrients.

We believe that the lack of nutrient removal and the consequent permanence of bacteria in the body of study water could be affected because the islands did not remain floating, since each time the work area was visited they were on the banks and damaged (without plants) because visitors and even those in charge of the dam set aside the islands and showed disinterest in their objective affecting the phytoremediation process in the water.



Graphic 1 Enterobacteria by distribution zones



Conclusions

Phytoremediation islands were implemented at the Llano Dam in Villa del Carbón in the State of Mexico. There was no decrease in enterobacteria and there were increases in nutrients such as phosphates and nitrates. We believe that the lack of participation of the community that uses the water resource could have an effect on the contact times of the islands with the water, affecting the phytoremediation process.

References

Cherian, S., Oliveira, M. 2005. Transgenic plants in phytoremediation: recent advances and new possibilities. Environmental Science & Technology. 39: 9377-9390.

CNA. 2017. Estadísticas del agua en México. Recuperado el 25 de agosto de 2019. http://sina.conagua.gob.mx/publicaciones/EAM_2017.pdf

Cho, C., Yavuz-Corapcioglu, M., Park, S., Sung, K. 2008. Effects of Grasses on the Fate of VOCs in Contaminated Soil and Air. Water, Air, & Soil Pollution. 187:243-250.

Eapen, S., Singh, S., D'Souza, S. F. 2007. Advances in development of transgenic plants for remediation of xenobiotic pollutants. Biotechnology Advances. 25:442-451.

INEGI. 2019. Agua. Recuperado el 21 de julio de 2019. http://cuentame.inegi.org.mx/territorio/agua/distribucion.aspx?tema=T

ISSN-On Line: 2524-2083

Franco, A., J., Toledo, E., Franco, A. Caracterización fisicoquímica y microbiológica de la presa del Llano ubicada en el municipio de Villa del Carbón Estado de México. Revista de energía, física y química. Vol.3 No.6 7-14.

Kelley, C., Gaither, K. K., Baca-Spry, A., Cruickshank, B. J. 2000. Incorporation of phytoremediation strategies into the introductory chemistry laboratory. Chem Educator. 5:140-143.

Martelo, J; Borrero, J. 2012. Macrófitas flotantes en el tratamiento de aguas residuales: una revisión del estado del arte. Ingeniería y Ciencia. Medellín. Tomo 8, N.º 15, 221-243.

Miretzky, P., Saralegui, A., Fernández-Cirelli, A. 2004. Aquatic macrophytes potential for the simultaneous removal of heavy metals Chemosphere. 57: 997-1005.

ISSN-On Line: 2524-2083

[Title in Times New Roman and Bold No. 14 in English and Spanish]

Surname (IN UPPERCASE), Name 1st Author†*, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor

Institutional Affiliation of Author including Dependency (No.10 Times New Roman and Italic)

International Identification of Science - Technology and Innovation

ID 1st author: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1st author: (Scholar-PNPC or SNI-CONACYT) (No.10 Times New Roman)

ID 1st coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 1st coauthor: (Scholar or SNI) (No.10 Times New Roman)

ID 2nd coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 2nd coauthor: (Scholar or SNI) (No.10 Times New Roman)

ID 3rd coauthor: (ORC ID - Researcher ID Thomson, arXiv Author ID - PubMed Author ID - Open ID) and CVU 3rd coauthor: (Scholar or SNI) (No.10 Times New Roman)

(Report Submission Date: Month, Day, and Year); Accepted (Insert date of Acceptance: Use Only RINOE)

Abstract (In English, 150-200 words)

Objectives
Methodology
Contribution

Abstract (In Spanish, 150-200 words)

Objectives
Methodology
Contribution

Keywords (In English)

Indicate 3 keywords in Times New Roman and Bold No. 10

Keywords (In Spanish)

Indicate 3 keywords in Times New Roman and Bold No. 10

Citation: Surname (IN UPPERCASE), Name 1st Author, Surname (IN UPPERCASE), Name 1st Coauthor, Surname (IN UPPERCASE), Name 2nd Coauthor and Surname (IN UPPERCASE), Name 3rd Coauthor. Paper Title. Journal-Urban-Rural and Regional Economy. Year 1-1: 1-11 [Times New Roman No.10]

* Correspondence to Author (example@example.org)
† Researcher contributing as first author.

Introduction

Text in Times New Roman No.12, single space.

General explanation of the subject and explain why it is important.

What is your added value with respect to other techniques?

Clearly focus each of its features

Clearly explain the problem to be solved and the central hypothesis.

Explanation of sections Article.

Development of headings and subheadings of the article with subsequent numbers

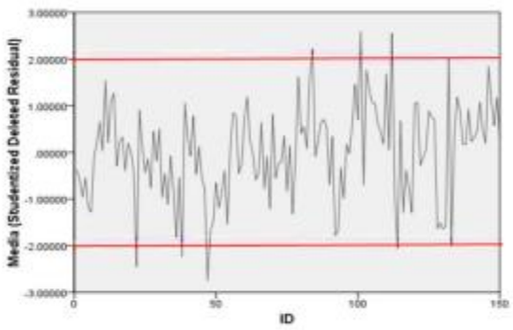
[Title No.12 in Times New Roman, single spaced and Bold]

Products in development No.12 Times New Roman, single spaced.

Including graphs, figures and tables-Editable

In the article content any graphic, table and figure should be editable formats that can change size, type and number of letter, for the purposes of edition, these must be high quality, not pixelated and should be noticeable even reducing image scale.

[Indicating the title at the bottom with No.10 and Times New Roman Bold]



Graphic 1 Title and Source (in italics).

Should not be images-everything must be editable.

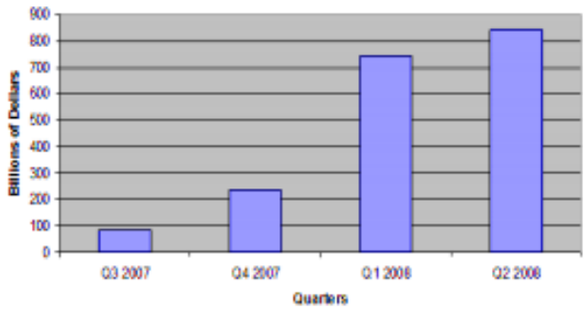


Figure 1 Title and Source (in italics).

Should not be images-everything must be editable.

	CLUSTER				
	1	2	3	4	5
SOLVENCY	3.31852	-.11404	-.15872	0.39771	-0.25761
LIQUIDITY	0.30333	-0.22337	-0.09989	-3.44381	0.54441
SIZE	0.43530	-0.17872	-0.60025	1.22512	0.77877
PROFITABILITY	0.51014	-3.48323	0.20618	-0.1863	0.02273

Table 1 Title and Source (in italics**).**

Should not be images-everything must be editable.

Each Article shall present separately in **3 folders**: a) Figures, b) Charts and c) Tables in .JPG format, indicating the number and sequential Bold Title.

For the use of equations, noted as follows:

$$Y_{ij} = \alpha + \sum_{h=1}^{r} \beta_h X_{hij} + u_j + e_{ij} \quad (1)$$

They must be editable and number aligned on the right side.

Methodology

Develop give the meaning of the variables in linear writing and important is the comparison of the used criteria.

Results

The results shall be by section of the Article.

Annexes

Tables and adequate sources

Thanks

Indicate if they were financed by any institution, University or company.

ISSN-On Line: 2524-2083

Conclusions

Explain clearly the results and possibilities of improvement.

References

Use APA system. Should not be numbered, nor with bullets, however if necessary numbering will be because reference or mention is made somewhere in the Article.

Use Roman Alphabet, all references you have used must be in the Roman Alphabet, even if you have quoted an Article, book in any of the official languages of the United Nations (English, French, German, Chinese, Russian, Portuguese, Italian, Spanish, Arabic), you must write the reference in Roman script and not in any of the official languages.

Technical Specifications

Each Article must submit your dates into a Word document (.docx):

Journal Name
Article title
Abstract
Keywords

Article sections, for example:

1. Introduction
2. Description of the method
3. Analysis from the regression demand curve
4. Results
5. Thanks
6. Conclusions
7. References

Author Name (s)
Email Correspondence to Author
References

Intellectual Property Requirements for editing:

-Authentic Signature in Color of Originality Format Author and Coauthors

-Authentic Signature in Color of the Acceptance Format of Author and Coauthors

ISSN-On Line: 2524-2083

Reservation to Editorial Policy

RINOE Journal-Urban-Rural and Regional Economy reserves the right to make editorial changes required to adapt the Articles to the Editorial Policy of the Journal. Once the Article is accepted in its final version, the Journal will send the author the proofs for review. RINOE® will only accept the correction of errata and errors or omissions arising from the editing process of the Journal, reserving in full the copyrights and content dissemination. No deletions, substitutions or additions that alter the formation of the Article will be accepted.

Code of Ethics - Good Practices and Declaration of Solution to Editorial Conflicts

Declaration of Originality and unpublished character of the Article, of Authors, on the obtaining of data and interpretation of results, Acknowledgments, Conflict of interests, Assignment of rights and Distribution.

The RINOE® Management claims to Authors of Articles that its content must be original, unpublished and of Scientific, Technological and Innovation content to be submitted for evaluation.

The Authors signing the Article must be the same that have contributed to its conception, realization and development, as well as obtaining the data, interpreting the results, drafting and reviewing it. The Corresponding Author of the proposed Article will request the form that follows.

Article title:

– The sending of an Article to RINOE Journal-Urban-Rural and Regional Economy emanates the commitment of the author not to submit it simultaneously to the consideration of other series publications for it must complement the Format of Originality for its Article, unless it is rejected by the Arbitration Committee, it may be withdrawn.

– None of the data presented in this article has been plagiarized or invented. The original data are clearly distinguished from those already published. And it is known of the test in PLAGSCAN if a level of plagiarism is detected Positive will not proceed to arbitrate.

– References are cited on which the information contained in the Article is based, as well as theories and data from other previously published Articles.

– The authors sign the Format of Authorization for their Article to be disseminated by means that RINOE® in its Holding Peru considers pertinent for disclosure and diffusion of its Article its Rights of Work.

– Consent has been obtained from those who have contributed unpublished data obtained through verbal or written communication, and such communication and Authorship are adequately identified.

– The Author and Co-Authors who sign this work have participated in its planning, design and execution, as well as in the interpretation of the results. They also critically reviewed the paper, approved its final version and agreed with its publication.

– No signature responsible for the work has been omitted and the criteria of Scientific Authorization are satisfied.

– The results of this Article have been interpreted objectively. Any results contrary to the point of view of those who sign are exposed and discussed in the Article.

Copyright and Access

The publication of this Article supposes the transfer of the copyright to RINOE® in its Holding Peru for its RINOE Journal-Urban-Rural and Regional Economy, which reserves the right to distribute on the Web the published version of the Article and the making available of the Article in This format supposes for its Authors the fulfilment of what is established in the Law of Science and Technology of the United Mexican States, regarding the obligation to allow access to the results of Scientific Research.

Article Title:

Name and Surnames of the Contact Author and the Coauthors	Signature
1.	
2.	
3.	
4.	

Principles of Ethics and Declaration of Solution to Editorial Conflicts

Editor Responsibilities

The Publisher undertakes to guarantee the confidentiality of the evaluation process, it may not disclose to the Arbitrators the identity of the Authors, nor may it reveal the identity of the Arbitrators at any time.

The Editor assumes the responsibility to properly inform the Author of the stage of the editorial process in which the text is sent, as well as the resolutions of Double-Blind Review.

The Editor should evaluate manuscripts and their intellectual content without distinction of race, gender, sexual orientation, religious beliefs, ethnicity, nationality, or the political philosophy of the Authors.

The Editor and his editing team of RINOE® Holdings will not disclose any information about Articles submitted to anyone other than the corresponding Author.

The Editor should make fair and impartial decisions and ensure a fair Double-Blind Review.

Responsibilities of the Editorial Board

The description of the peer review processes is made known by the Editorial Board in order that the Authors know what the evaluation criteria are and will always be willing to justify any controversy in the evaluation process. In case of Plagiarism Detection to the Article the Committee notifies the Authors for Violation to the Right of Scientific, Technological and Innovation Authorization.

Responsibilities of the Arbitration Committee

The Arbitrators undertake to notify about any unethical conduct by the Authors and to indicate all the information that may be reason to reject the publication of the Articles. In addition, they must undertake to keep confidential information related to the Articles they evaluate.

Any manuscript received for your arbitration must be treated as confidential, should not be displayed or discussed with other experts, except with the permission of the Editor.

The Arbitrators must be conducted objectively, any personal criticism of the Author is inappropriate.

The Arbitrators must express their points of view with clarity and with valid arguments that contribute to the Scientific, Technological and Innovation of the Author.

The Arbitrators should not evaluate manuscripts in which they have conflicts of interest and have been notified to the Editor before submitting the Article for Double-Blind Review.

Responsibilities of the Authors

Authors must guarantee that their articles are the product of their original work and that the data has been obtained ethically.

Authors must ensure that they have not been previously published or that they are not considered in another serial publication.

Authors must strictly follow the rules for the publication of Defined Articles by the Editorial Board.

The authors have requested that the text in all its forms be an unethical editorial behavior and is unacceptable, consequently, any manuscript that incurs in plagiarism is eliminated and not considered for publication.

Authors should cite publications that have been influential in the nature of the Article submitted to arbitration.

Information services

Indexation - Bases and Repositories

Research Gate (USA)
Google Scholar (Citation indices-Google)
Mendeley ((Bibliographic References Manager)

Publishing Services:
Citation and Index Identification H.
Management of Originality Format and Authorization.
Testing Article with PLAGSCAN.
Article Evaluation.
Certificate of Double-Blind Review.
Article Edition.
Web layout.
Indexing and Repository
ArticleTranslation.
Article Publication.
Certificate of Article.
Service Billing.

APC regulations
The APC Publication Rate must only be made by the corresponding author, with the understanding that the Coauthors are third parties who supported the development of the article and these are included in the same rate, with the same rights and privileges of the work, as noted In the principles of Ethics and Conduct of RINOE®, supporting those who have less access to information and those emanated from the International Service of Science and Technology of the IDB, WIPO, OAS, OECD and UN.

Editorial Policy and Management

1047 Avenida La Raza -Santa Ana, Cusco - Peru. Phones: +52 1 55 1260 0355, +52 1 55 6159 2296, +52 1 55 6034 9181; E-mail: contact@rinoe.org www.rinoe.org

RINOE® Journal-Urban-Rural and Regional Economy

Site Licences

03-2010-032610094200-01-For printed material, 03-2010-031613323600-01-For Electronic material,03-2010-032610105200-01-For Photographic material,03-2010-032610115700-14-For the facts Compilation,04-2010-031613323600-01-For its Web page,19502-For the Iberoamerican and Caribbean Indexation,20-281 HB9-For its indexation in Latin-American in Social Sciences and Humanities,671-For its indexing in Electronic Scientific Journals Spanish and Latin-America,7045008-For its divulgation and edition in the Ministry of Education and Culture-Spain,25409-For its repository in the Biblioteca Universitaria-Madrid,16258-For its indexing in the Dialnet,20589-For its indexing in the edited Journals in the countries of Iberian-America and the Caribbean, 15048-For the international registration of Congress and Colloquiums. financingprograms@rinoe.org

Management Offices

1047 Avenida La Raza -Santa Ana, Cusco - Peru.

Journal-Urban, Rural and Regional economy

2524 2083
ISSN 2524- 2083
www.rinoe.org