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19**

Annual Report

Embrapa

Suínos e Aves

PRESENTATION

We finish 2019 with so much satisfaction and we are ready to start 2020 with continuous challenges. Herein we register our main results of the year as a way to keep the society informed and appreciate the trust of the productive chain in our research efforts.

Another year we acted with budget contingency and many other difficulties as the reduction in our collaborators team due to the Stimulated Dismissal Plan – PDI. However, once again we overcame the challenges with dedication and creativity from all technical members and support ones as well. Also as usual, we could count on our partners, private or public ones. Partnership was fundamental for us to implement many projects and actions, contributing to the establishment of public policies, as the regulation for the disposal of dead animals. Practices, processes and methodologies were delivered to society, such as the Fauna Integrated Handling System – SIMF, implemented by Ibama for controlling wild boar.

Moreover, 2019 was also highlighted as a milestone to insert Embrapa Suínos e Aves in a challenging scenario, the innovation one. With the realization of the first ideas challenge for pig farming, InovaPork, the Unit opened the doors to a reality even more necessary for the production chains evolution. And, to celebrate 45 years, in 2020, an event focused on poultry farming will be held, InovaAvi. Innovation is a one-way road and it leads to many developments for research. We invite you to take a look in this report and know better some of our outputs in 2019. They are resulted from the efforts of the team of Embrapa Suínos e Aves, which mission is to contribute with the evolution of both pig and poultry farming, assuring that the final product meets the requirements of the entire society.

Have a good reading!

Janice Reis Ciacchi Zanella
Head of Embrapa Suínos e Aves





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**US\$ 1 = R\$ 5.64 (May 6th, 2020)*



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Suínos



YEARS
INNOVATION
MOVE US

rapa
e Aves



Analysis | 2018 Production Performance



13.1 million

Brazil produced 13.1 million tons of poultry meat in 2019, the biggest production worldwide. Exports reached 4.212 million tons, also the greatest around the world. The national production increased 2.3% in comparison to 2018.



4.1 million

The national production hit 4.1 million tons of swine meat in 2019, the fourth greatest in the world. Exports were 750.3 thousand tons, also the fourth greatest in world. In comparison to 2018, the Brazilian exports had an improvement of 16.2%.



49 billion

Brazil produced 49 billion units of eggs, an output 10% superior than in 2018. The per capita consumption in the country reached 230 units and hit a level 9% bigger in comparison to 2018.

Scenario

IMPACTS OF ASF BENEFITS BRAZIL

Disease that hits Asia leads to world rearrangements

In 2019, the production and world trading of pork meat were deeply impacted by the outbreaks of African swine fever (ASF), which rose up in China and then hit the other countries.

China is responsible for almost half of the world production of pork meat and the impact of eliminating its herds in order to control the disease took extraordinary proportions. The disease reduced nearly 14% of the production in comparison to 2018 and the impacts expected for 2020 are even bigger, projecting a reduction of 25% in that country and there is no perspective about how much time will be necessary to re-establish the previous production levels.

In this scenario, Brazil (+20%), European Union (+13%) and USA (+11%) are pointed as the countries which shipments will keep on growing for at least three years. Up to

October, the Brazilian exports to China increased 38.7% in relation to the same period of last year. Currently, China absorbs 31.5% of the Brazilian exports related to pork meat.

The demand heightening provided also the improvement of the value of exports in Brazil. In the first months of 2019, the average price of pork meat exported was US\$ 2,090 per ton, 11.8% higher than in 2018. In absolute terms, the value exported until October 2019 was US\$ 1.22 billion.

The heightened demand also reflected on the price paid to the pig farmer and on the prices of pork meat in the internal market. In 2019, in the independent market of Santa Catarina, the monthly average of prices for live swine, up to October, was US\$ 0.73, value 35.7% higher than the average for the same period in 2018.

The African swine fever caused an increase in the world production of poultry meat, so

that it may overcome the swine one in 2020, as a response to the increment on demand and the rising of the world prices.

Even so, the production of this meat in Brazil passes through a period of stagnation, with an average increment of 1.11% per year since 2010. This fact happened due to many reasons, as the high per capita consumption of poultry meat in Brazil, the difficulty to amplify the exports related to sanitary and technical barriers, the expansion of the production in countries traditionally importers.

Taking into account the increase in demand in China, Filipinas and Vietnam, that suffer with the problem of African swine fever, and the continuous increase in consumption in other countries in Asia and Africa, due to the income effect, an improvement of the production in all the main countries that produce poultry is expected for 2020.



Operation

IMPROVEMENTS IN INFRASTRUCTURE

Management team invested on internal demands

The main challenge of 2019 was to maintain a wide acting on research and support with a significant reduction on employees, due to their adherence to the Stimulated Dismissal Plan – SDP. The budget issue, with contingency, also demanded extra efforts of the whole management team so that commitments and results could be achieved. For that, the teams were reorganized and internal improvements and investments

were performed to adjust the work areas. An example it was the automation of some systems to help out the daily farming.

For research, the institutional changes at Embrapa brought an even wider view of innovation, with readjustments on the planning of the projects management. New innovation challenges were established, including research areas and leading to the attendance of new work fronts.

For the management of experimental facilities, 2019 was a year of improvements and consolidation of the reforms at the farm for swine genetic improvement and at the research facilities where metabolism experiments are carried out. The continuous acting of the teams about biosecurity to maintain the sanitary status of the farms has been another effort of the management team.



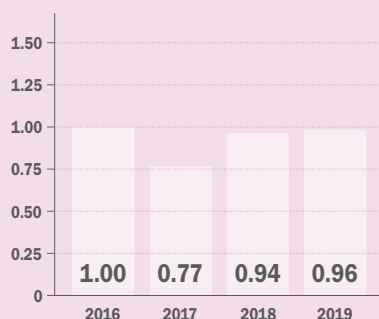
Documents

Protected from deterioration

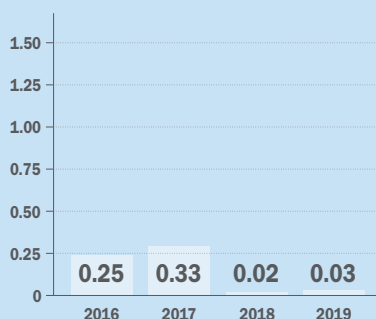
In 2019, an important management action was executed: adjusting the general archive. Despite properly organized and everything registered in the General Archive Management System, the conditions for the preservation weren't appropriate. So, after a joint work among sectors, the General Archive was re-structured according to the standards required by law. After transferring the general archive to the annexed area in the library at the administrative building, it was possible to integrate both protocol and archive, as well as to create an area for external consultation of the archive. The new place is well ventilated and illuminated, and also safer and more protected from deterioration agents and leakage of sensitive information.



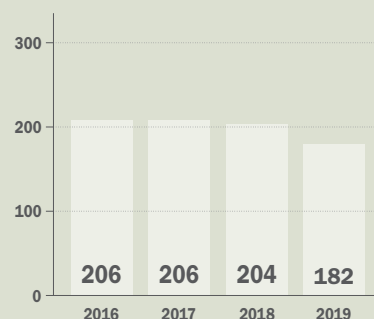
Total costing in US\$ million



Investment in US\$ million



Employees in December 31



Results

Research deliveries

The final results of the Unit reached 35 in 2019. For the item Training and Technological Updating of Multiplier Agents, seven results were delivered, followed by Technical Scientific Methodology and Data Bank, each one with six results. Support for Formulation or Execution of Public Policies provided 5 results in the Unit. Besides, other results were also delivered related to Knowledge Advance, Institutional Arrangement, Socioeconomic Studies, Agricultural Practice/Process and Software for external customer.



Research management Migration alters dynamics

Embrapa adjusted its projects in the Embrapa Management System – SEG, which altered the way for approving and managing the projects. With these changes, carried out since 2018, some projects ended and others migrated to a new platform, acquiring agility and focus on the results delivery.

This work concentrated 32 projects for the upcoming year (2020), divided into the categories Type I (10), Type II (8), Type III, Type IV (9). In this new focus, the projects are approved along the year in open calls for proposal submissions.

From the adhesion of this new way to manage projects on, the institution sets aside the model focused on production for embracing the innovation concept. The objective is to approximate Embrapa even closer to the productive chains, reinforcing its compromise to provide solutions to the Brazilian agriculture.

Research

UNIT HAS A WIDE PROJECT PORTFOLIO

The technical team responded demands in 72 projects

The year 2019 counted on the acting of the technical team of Embrapa Suínos e Aves in 72 research projects. Among them, 44 were headed by the Unit and the others were under control of partners. The projects covered different areas of the production chain, from the production to the technology transfer and solutions for the market.

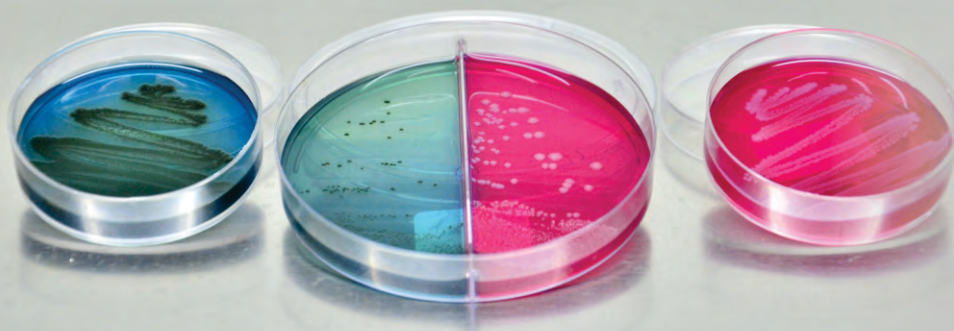
Regarding the ongoing projects, nine were ended formally in the Embrapa Management System. Two of them presented results about animal welfare, partnered with the Ministry of Agriculture, Livestock and Supply. One of them focused on production of laying broilers and the other on good

practices to migrate the hosting systems of swine matrices from gestation cells to collective stalls. The project "Evaluation of indicators and strategies for valuation of environmental services in hydrographic bays with intensive animal production" was also finished in 2019 and involved many agents from the productive chain.

The sanity area also concluded projects. Researchers developed a low density panel of SNPs for swine traceability, and also a real time PCR technique for fast multi-detection of Salmonella and evaluation of the infection dynamics in poultry under controlled conditions.

Another finished project was about review and modernization of the inspection procedures ante and post mortem applied in swine slaughterhouses under Federal Inspection. On it, researchers acted together with specialists from MAPA and they keep on presenting results, as the training of the teams from slaughterhouses through on-line course.

In addition, two projects related to animal nutrition were concluded. Researchers evaluated ingredients and improver additives on the performance of broilers and also antioxidants in their diet to prevent the lipid oxidation on swine meat.



Numbers of 2019

The Unit published **49 articles** in peer reviewed journals with **level A**, the highest quality possible.

The total number of **scientific papers** published in indexed journals reached **88**.

10 media articles and **61 articles** were published in scientific meetings.

The number of **edited books** reached **9**.

25 chapters were published in **technical-scientific books** last year.

9 folders/leaflets/booklets and **27 Series Documents** were edited by the technical staff.

Ongoing and approved projects in 2019

Projects under Embrapa Suínos e Aves direct coordination	Research Funding		
Identification of genes and pathways involved in the manifestation of pectoral myopathies in broiler chickens	Type I - 03/2019	Determination of moisture, protein and moisture/protein relations in poultry to subsidize the Legislation	ABPA
New technologies and sanitary practices to improve fertility and to reduce microbiological contamination in swine semen minimizing the use of antibiotics	Type II - 03/2019	Nutritional value of winter cereals in Santa Catarina State	FECOAGRO-SC
Vaccine development for control of pulmonary pasteurellosis in pigs	Type III - 00/2019 Ourofino	Broilers performance fed with different enzyme combinations diets	Cargill
Prediction of metabolizable energy and determination of ileal digestibility of amino acids of corn DDGS and deactivated soybean and evaluation of the effect of a protease on its nutritional value.	Type III - 00/2019 Seara/Danisco	Evaluation of enzyme and probiotic in poultry diets on performance, nutrient digestibility and gut health	Elanco
Technology transfer in ecological egg production systems southernwest Parana - Brazil	Type IV - 00/2019	Evaluation of technical, economic and welfare indicators from pig production systems	BRF
Model of environmental management for areas of intensive animal production in southern Brazil	Type I - 03/2018	Evaluate euthanasia methods for pigs in different production stages	Seara
Development and evaluation of nanomedicine for the treatment of coccidiosis in broiler chickens	Type II - 03/2018	Correlation between pepsin digestibility and in vivo values of amino acid digestibility in autoclaved meal for broilers	EVONIK / Seara
Improvement of bacteriophages for salmonellosis control in poultry	Type II - 03/2018	Study of technologic routes for recovery, pretreatment and final destination of organic agroindustrial wastes from CETRIC	Cetric
Integration of technologies for the treatment and agronomic use of piggy wastes to mitigate the global warming potential of swine production chain	Type II - 03/2018		
Wild Boar – Part 2	Type II - 03/2018		
Swine, poultry and caititus in situ conservation	Type I		
Review and modernization of ante and post mortem inspection applied to pig's slaughterhouse with federal inspection	Type IV		
Development of a new virosomal antigen delivery system and its effectiveness in the local and systemic immune response	Type I		
Technologies for destination of dead animals	Type I		
Review and modernization of the inspection system applied to avian's slaughterhouse with federal inspection	Type IV		
Evaluation of indicators and strategies for valuing environmental services in watersheds with intensive livestock production	Type I		
Genetic and antigenic diversity of influenza A viruses and efficacy of diagnostic methods and nanotechnological vaccine for the control of influenza in swine	Type II		
Swine and poultry genetic modification methodologies improvement platform	Type II		
Calcium, phosphorus, and vitamin D levels in laying hen diets to improve productivity and reduce pollutant impact on the environment	Type I		
Nicarbazine residues in chicken meat raised on reused litter	Type I		
Evaluation of the immunological components of swine fresh and frozen colostrum	Type I		
Technology transfer for production and use of biogas and fertilizers from pig and poultry manure treatment under the ABC Plan	Type IV		
Cooperation, communication and technology transfer for the production of safe pork without the use of antimicrobials	Type IV		
Technological platform for swine breeding programs	Type III BNDES/BRF		
Development of a low-density SNP panel for swine traceability	Type III Fapesc		
Good practices for migration of housing systems from swine to gestation cells for collective bays	Type IV Mapa		
Effect of a pellet quality improver (Bredol) on nutrient digestibility and performance of broiler chickens	Akzonobel		
Biotechnological process for swine wastewater treatment - Sistrates	Type III BNDES		
Evaluation of dietary antioxidant ingredients to prevent lipid oxidation in pork and processed pork products enriched with omega-3 fatty acids	Gran Cru/Cargill/ Pepinão/Unicamp		
Greenhouse gases mitigation on swine slurry treatment and use as organic fertilizer	Type I - CNPq		
Evaluation of different doses and types of enzymes in performance, nutrient digestibility and bone composition in broilers	BASF		
Prospecting technologies for the production chain of broilers	Fund. Araucária		
Support to the poultry and pig production chains to access the drawback system benefit	Type IV - ABPA		
Welfare in laying production	Type IV - Mapa		
Effect of disinfectants on avian virus inactivation	PolySell		
Increase the efficiency of the composting process at Vossko company	Vossko		
Projects which had other research center leadership	Research Funding		
Castor meal for feed and organic fertilizer for nematodes control	Type III - 00/2019		
Development of new technological platforms in reproductive biotechnologies	Type I		
Reproductive biotechnologies for the emerging production systems in Brazil	Type II		
Implementation and Monitoring of Quality Systems in the Microorganisms Network (QUALIMICRO)	Type IV		
Communication strategies for the Bucket Full Network	Type IV		
Institutional Collections of Microorganisms	Type I		
Management and digital curatorship of Animal GRIN (Alelo Animal) Database	Type II		
Ex situ conservation of animal genetics resources	Type I		
Management and digital curatorship of Animal GRIN (Alelo Animal) Database	Type II		
Evaluation of risk factors for specific pathogens and ripening time in Brazilian artisanal cheeses to ensure their safety	Type I		
Modulation of the immune system to control haemoncosis in sheep	Type I		
Breeding oats, rye, triticale and dual purpose wheat for agricultural systems in southern Brazil	Type III		
Technological solutions to optimize the use of waste and biomass as source of agricultural inputs in organic production systems	Type I		
Technological and incremental development of sheep meat products as opportunity of adding value	Type II		
Multidiagnostic strategy evaluation for sanitation of farms with bovine tuberculosis	Embrapa		
Standardization of Methodologies and of New Approaches to Economic Evaluation of Crop-Livestock-Forest Integration Systems	Embrapa		
Structuring of an expert team to apply vertebrate studies on sustained development of Mato Grosso do Sul state	Embrapa		
Development of liposomal immunomodulatory nanosystem with active guidance to hepatocytes as a future alternative tool for R. microplus cattle tick control	Type I		
Machines and equipment for family farming	Embrapa		
Development and implementation of strategies for managing the Animal Health Portfolio	Embrapa		
Method validation on fatty acid profile and CLA from milk fat	Embrapa		
Development and implementation of strategies for managing the Genetic Engineering in Agribusiness portfolio	Embrapa		
Characterization of handmade cheese produced in municipalities within the Green Corridor Mantiqueira - generating income to family farmers and safe food for consumers	Embrapa		
Metaproteomics of ignocellulolytic enzymes from ruminal microbiota of Morada Nova sheep	CNPq		
Dissemination, expansion and applicability of the Biodigester Septic Tank as social technology for rural basic sanitation	Type I - Fundação Banco do Brasil		
Implementation of SiExp at Embrapa	Type IV - Projeto Especial SEG		
Development of production systems and technological packages for making feasible sustainable production of microalgae biomass in biorrefineries for different Brazilian regions	Type II - 03/2018		
Cleaning technology suitable for the processing of quality shell eggs from small scale farming	Type II - 03/2018		

BiogásFert Network has a new webpage

The BiogásFert Network, from the project "Technologies for production and use of biogas and fertilizers from the treatment of animals manure in the scope of ABC plan", got a new website in 2019. Available at the address embrapa.br/suinos-e-aves/biogasfert, the page presents the results of the network researches and it is an action from the project TTBiogásFert, for transferring these technologies.



TTBiogásfert Trainings and field days

In 2019, the project TTBiogásFert did many actions for transferring technologies. One of them was the basic course on sizing and implementation of biodigesters for technicians from Epagri of Tubarão and Braço do Norte cities, both in SC. Another one was the field days in Palmitinho-RS, Pinhal-RS and Rondinha-RA about sustainable pig farming, a partnership with Emater-RS that trained rural extension technicians and producers about water management, management and use of manure, as well as valuation of swine manure as fertilizer.



Nutrition

WINTER CEREALS IS THEME OF RESEARCH

Stimulation plan will be implemented in RS and SC

The Stimulation Plan for Production of Winter Cereals for use in feeds in Rio Grande do Sul advanced in 2019 and it may be implemented from the first crop in 2020. In Santa Catarina, the articulation with the government is already established and may be implemented within the first months of the year. The work has been performed by researchers from Embrapa Trigo (Passo Fundo-RS) and

Embrapa Suínos e Aves with the federations and cooperatives as a way to establish an alternative to diversify the food matrix for animal nutrition complementing the binomial maize and soybean meal.

At the Unit in Concórdia, researchers evaluated barley for feeding swine. The research results show that the inclusion of barley up to 80% as substitute for maize didn't change the animals' performance, since the levels of

energy were kept. Barley could be used up to 10% for the initial phase and freely for the other phases, taking into account the maximum fiber content and required nutritional values.

The articulations in both states have counted on the support of many cooperatives and federations related to agriculture and have been highlighted in the discussions at editions of More Maize Forum, event organized by the Rural Channel.



SMART

Model to intensive animal production

In September, Embrapa and the city hall of Presidente Castello Branco city, in western Santa Catarina, signed an agreement for technical cooperation involving the projects "Development of a model for environmental management of areas with intensive animal production in Southern Brazil – Smart" and "Technology Transfer for production and use of biogas and fertilizers from the treatment of swine and poultry manure in the scope of ABC Plan".

The project Smart aims to develop a model for integrated environmental management focused on hydrographic bays with intensive animal production situated in Southern Brazil, based on multi-criteria approach and information geospatialization.

Presidente Castello Branco city was identified as potential for the execution of some activities expected in the project scope, which is already in execution. According to IBGE, the city has 1,568 inhabitants and 251 rural

enterprises, with 455 thousand birds, 52 thousand pigs and 2.4 thousand dairy cattle.

The cooperation assures the support and simplification of the project actions by the city hall, as Embrapa compromises to transfer technologies related to waste handling, environmental protection and organization of the information, developing the first environmental registration of the rural area in the city, including geospatialized information of the rural properties.

Swine Fevers

CHALLENGE IS TO KEEP THE HERD SANITY

Classic and Asian swine fever frightened in 2019

More than one year after the virus of African swine fever (ASF) was detected in animals for subsistence in China, in September 2018, the world market didn't recover from the production drop yet. The disease is extremely contagious and doesn't have cure or treatment, affecting pigs and wild boars, but no effect in humans. A superficial evaluation of the virus introduction in the Brazilian swine population shows that the loss would be around US\$ 5.5 billion, based on the number of slaughtered pigs per year.

The ASF virus was identified at first time in Africa in the beginning of the 20th century and they estimate it reached Europe in 1957 through the food waste served in the aircrafts containing products derived from contaminated swine with ASF. In Brazil, the virus was identified in 1978, but the disease was

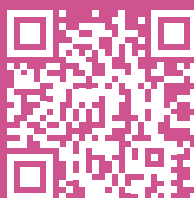
eradicated in country, which is considered ASF-free since 1984.

Internally, the major concern was about the entrance of the virus for classic swine fever in the disease-free zone in Brazil recognized by the World Animal Health Organization (OIE). Within 12 months, between October 2018 and October 2019, 68 focuses were confirmed in the country in the states Ceará, Piauí and Alagoas. The disease outbreak in the free zone could set in risk the agribusiness and national exportations.

Specialists from Embrapa Suínos e Aves recommend not transporting products derived of swine meat from the regions affected by the disease, washing the trucks and drivers' clothes that passed by where the virus was found and performing rigorous control for accessing swine farms via biosecurity program. The

transmission of PSC happens through the intake of food or water contaminated by animals, including the inhalation of contaminated droplets from other pigs nearby, and even through artificial insemination.

Embrapa Suínos e Aves prepared a special website with hints and information about the African swine fever and released a technical note about the classic swine fever, also available at its portal.



Scan this code and have access to the page or go straight to the website: www.embrapa.br/suinos-e-aves/psa

Validation

Rapid test for Influenza A



Researchers from the Unit developed and validated a rapid test for detecting and differentiating the subtypes of Influenza A virus (IAV) in swine: RT-qPCR multiplex, in real time. The analytical specificity of the technique was 100%, in other words, the subtypes and the viral strain were correctly identified by the test. In the last step of the validation, clinical samples from pigs, previously diagnosed positive for IAV, were analyzed. Seventy four percent of the clinical samples analyzed had the subtype and virus strain identified, being H3N2 (46.3%) the most detected subtype, followed by H1Npdm (33.3%) and H1N1 (11.1%). Diagnostic and research laboratories will be the main beneficiaries of this new methodology.

Public policies

Drawback boosts exports

Drawback is a special customs procedure that consists in suspending or eliminating the incident taxes on inputs used in exported products. The mechanism works as an incentive for exports because it reduces the production costs of exportable products, making them more competitive in the international market. Embrapa Suínos e Aves maintains an electronic spreadsheet and four tables at the website of the Swine and Poultry Intelligence Central (CIAS), embrapa.br/suinos-e-aves/cias. These tools are useful for conversion

between inputs and products to be used in the calculations of drawback and reference. The material was elaborated in partnership with the Brazilian Animal Protein Association (ABPA) and the Ministry of Industry, Foreign Trade and Services (MDIC) and it includes the productive chains of broilers, swine, turkey and laying broilers.

With drawback, the enterprises can save from 35% to 50% in the acquisitions in the internal market and almost 60% in the exports. The economic impact and the relevance of the public policy of this procedure,

represented by the reduction of production costs, are really significant. The percentages vary according to the inputs and the considered products. In the case of broilers, for example, from each US\$ 1 imported with drawback, US\$ 6 is exported, making it clear that it is a regime that generates important currencies for the country. The global impact was US\$ 102.8 million in benefit only for the poultry chain in the accumulated within seven years, since when Embrapa has been executing this service.



Biogas Practices and Processes



The book "Fundamentals of anaerobic digestion, biogas purification, use and treatment of the digestate" was released in May during the International Symposium on Agricultural and Agroindustrial Waste Management (Sigera) in Florianópolis-SC. The work compiles the accumulated knowledge over more than one decade by Embrapa and its network of partners on development of practices and processes for management and treatment of agricultural liquid effluent with high content of organic matter and nutrients and it is available for free download at Embrapa Suínos e Aves's website. Scan the code below to access the book



Highlight

EMBRAPA DEVELOPS IN FOR TREATMENT OF SW

Treatment allows reuse of water and optimization of the area, as

Effluents from pig farming, resulted of intensive production, represent a huge challenge for the properties, especially because some of them don't have rural area to use the residues as biofertilizer. In these cases, the residues represent a strong potential pollutant for the environment. In the past years, the technical team from Embrapa Suínos e Aves has dedicated themselves to study a new process for treating these effluents, bringing up alternatives to the production and to the environment. So, since 2010, the Treatment System for Pig Farming Effluents – Sistrates has been the big investment of Embrapa.

The system, that is installed at Granja Master, in Videira-SC, presents an innovative aspect due to the

simultaneous removal of carbon, nitrogen and phosphorus through the combination of biological and chemical processes. Another differential is that the process can be applied in a modular and additional manner, according to the treatment requirements and the property condition.

The project has the rational of treatment of effluents from pig farming, in other words, treatment of manure from the swine production, for utilization in great production systems. It works from a set of modular systems that are applied to the treatment, resulting in a final effluent with excellent quality.

The technology allows obtaining a high level of treatability of residual waters from pig farming, what reduces

the necessity of rural area for its destination and it opens the opportunity to reuse the water in the installations or in irrigation processes. The resultant effluent of the process meets the required standards of the Resolution 430 of the National Environment Conceal – Conama, that regulates about the conditions and standards for the release of effluents in water bodies.

The potential market of Sistrates is huge farms of intensive production with restrictions of rural areas for the utilization of the manure or effluents or even with necessity to reuse the water. Centralized units of treatment in hydro-graphic bays or central plants of biogas for co-generation of electric or thermal energy are also among the potential users.



NOVATIVE SYSTEM INE MANURE

s well as reduction of environmental impact of the activity

The process

Sistrates consists of three different modules: Biodigesters – Module Bio; system for nitrogen removal – Module N; and system for phosphorous removal – Module P. The first step of the process is the residues receipt, where the manure reaches the reservoirs and passes through a system to separate coarse solids, composed of a sieve with rotating brushes. From the entrance of the manure in the system, the separated solids are destined to a high rate biodigester and the liquid effluent continues, by gravity, to the covered lagoon biodigester. These two biodigesters correspond to the first module, Bio.

At this module it happens the generation of biogas to produce electric energy. The most important aspect of this module is the possibility to recover biogas, which can be conducted to generator sets – engines that perform the generation of electric energy, contain this gas and allow the energy generation. So, at this module there are the removal of organic matter and energy generation.

The effluent of the covered lagoon biodigesters has, in its composition, high content of nitrogen because the process of anaerobic digestion isn't able to remove ammoniacal nitrogen. At the second module of Sistrates, Module N, the nitrogen removal occurs through biological process of nitrification, followed by denitrification, producing nitrogen gas. At the end of the process, the effluent meets release standards, where the concentration of ammoniacal nitrogen is lower than 20 milligram per liter.

The last module of Sistrates consists of phosphorous removal, which happens through chemical process of precipitation. Phosphorous is converted in solid calcium phosphate. For the precipitation reaction, it is used a suspension of calcium hydroxide, or hydrated lime at 10%. The recovered phosphorous in the end can be used for agronomic purposes, as fertilizers. Another result of this module is the struvite removal, a mineral rich in phosphorous that is formed naturally in the pipes of the effluent systems due to the manure composition. Over time, this mineral blocks the pipes, turning into a problem.

The final product

The result of the whole Sistrates process lays on the possibility of water reuse, since the quality of the treated effluent allows so. Also, it is possible to use the recovered phosphorous for application as soil fertilizer.

Field validation

Sistrates is installed and validated at Granja Master São Roque, localized in Videira-SC, which has the capacity to accommodate 9,500 sow and a production of 256 thousands pigs/year. Sistrates fulfilled the farm demands to solve the issue of production residues and to improve and adjust processes, such as the use of water. In the region where the farm is, there are few crop areas to apply the compost, which turned into a challenge for the production. The water consumption was also another problem, for being so high, and the farm needed alternatives to operate with more sustainability. Today, seven years later, the production rose from 241 thousand to 256 thousand piglets per year and the water consumption halved.

In addition to the field validation in real scale, at Granja Master, it will be possible to implement a network of Technological Reference Units (UTR) in the main regions of swine production to support the technology transfer, the continuous training of technicians and to facilitate the continuous improvement of the system.



Scan this code to see the technical video of Sistrates (Treatment System for Pig Farming Effluents) under functioning at Granja Master, in Videira-SC.

The Treatment System for Pig Farming Effluents, Sistrates, is a project financed by the National Bank of Economic and Social Development – BNDES, including Embrapa as technological institution, Master Agroindustrial as intervenient institution and Support Foundation to Research and Development – FAPED as support institution.

Financial Support



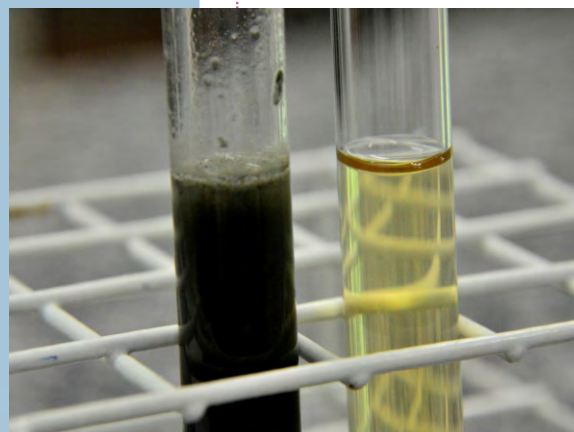
Intervient Enterprise



Support Institution



Fundação de Apoio à Pesquisa e ao Desenvolvimento



Improvement Genomic selection

Embrapa carried out the development of an exclusive information system for Swine Genetic Improvement Programs, which was validated and implemented at the company BRF, partner of the project. The implementation of this software and the other modules of the swine technological platform by the Brazilian enterprises of swine genetics have the potential to improve nearly 10% the annual genetic gains and, consequently, enhance the competitiveness of Brazilian providers of swine genetic to the productive chain. It uses collected data that allow genomic selection, which is a strong trend so that the national swine genetic improvement programs keep on competitive in relation to the international ones.



Genetics Cellular transfection more efficient

Researchers from Embrapa developed methodologies to produce genetically modified cells and embryos for swine species. It consists of a cationic polymer, Polyethylenimine (PEI) that has the capacity to condense exogenous DNA, forming complexes that are carried inside the cells after simple incubation for short periods of time.

The development of genetically modified pigs, for genes that make them more productive, disease resistant or with lower environmental impact, can be an alternative for producers that use national genetics to obtain higher profits, making them more competitive.

Handling

REAL TIME MONITORING OF WILD BOAR

SIMAF streamlined the species control and monitoring

Since the Fauna Integrated Handling System – SIMAF was established by the IN Ibama nº 12/2019 and implemented in April 2019, the wild boar control and handling present important results in the country. The main one is the increase on the amount of insertions and the quality of wild boar handling data in the country, allowing qualitative analyses.

SIMAF is a system for information and management developed by Embrapa and delivered to Ibama to facilitate the access of rural owner or wild boar controller to forward information and required documents for controlling the species.

After only six months of use, it increased 136.8% in receipt of handling reports and 333% in slaughter reports in comparison to the previous year, when there was no computerized system yet. Before SIMAF, the Declarations and Wild Boar Handling Reports were performed by the handlers in paper-based forms and delivered in person at the Ibama's units, making the data compilation process more time-consuming. As consequence, the acquisition of updated data about the situation of wild boar invasion was difficult, as well as the elaboration of proper strategies to guide handling.

The system allows Ibama

real time access to the amount of released handling authorizations, authorized persons, properties where handling is happening, slaughtered animals/handling method, period and locality. This information allows inferences about population estimations, population distribution, efficacy of the handling methods and effort to monitor priority areas to prevent and control the population, supporting decision-making and improvement of the wild boar handling management. Also, it is strategic for epidemiologic vigilance of these populations, considering the sanitary risk they represent to livestock.



On farm animal carcasses

Collection has regulation

The processes for collecting, transportation, processing and destination of dead animals and residues of livestock production as alternative to their elimination at rural properties are regulated since October 2019, when Mapa published IN 48. The norms define from the collection until the final destination and they counted on the contribution of productive chain, state agencies for agricultural defense and universities for their elaboration, as well as the scientific studies of Embrapa Suínos e Aves.

One of the norms refers to the animal collection in properties and it was based on the work on risk analysis headed by researchers who identified scenarios and evaluated routes and biosafety issues. Another point of this IN is the destination of the generated products in the transformation process. These products can be used as inputs for chemical industry, energy, fertilizer, biodiesel, hygiene and cleaning. The final product – the meat meal – can't be used for human or animal feeding in the country. In the case of exportation, it must meet the requirements of the destination country and must contain the information "it is produced with animals and residues from livestock production" on its label and that its use is forbidden for animal feeding.

Welfare

ANIMAL PRODUCTION WITH SUSTAINABILITY

Satisfaction of requirements has continuously Embrapa's attention



The research on welfare in animal production is one of the priorities of Embrapa. In 2019, the subject was discussed in many trainings along Brazil, in both swine and eggs production areas.

In the case of eggs production, updates and trainings happened in Espírito Santo and in Pernambuco in partnership with the Poultry Producers Association of Espírito Santo State (Aves) and Nupea Esalq-USP. The meetings discussed the technical advances and the welfare practices applied to layer poultry

farming in the country, compiling the views of Government, enterprises and producers.

In addition, four videos were produced about layer broilers pecking, which are available at the Embrapa's channel on YouTube ([youtube.com/Embrapa](https://www.youtube.com/Embrapa)). The videos guide the trim process in general and explain specifically the conventional pecking with hot flat blade, with hot V-shape blade and with radiation or infrared light.

In May, two booklets focused on sustainability and good practices were released by

the Brazilian Association of Swine Producers (ABCS) with support of Embrapa. The booklets are available in e-book format. Also, information about animal welfare was brought to events where Embrapa took part, as AveSui (PR), South Brazil Symposium on Pig Farming (SC) and Siavs (SP). Additionally, possible partnerships and technical cooperation were discussed with enterprises for swine production, matrices accommodation system, meat quality and methods of euthanasia and stunning for swine and poultry.

SIF Poultry

Myopathies classified in industry

One of the referrals of the team of Project on Modernization of SIF – Poultry System was the elaboration of a Technical Note about Myopathies, an important issue for condemnation of poultry meat, to be used as subsidies to define and to guide the industry about the procedures in the moment of classification and destination of cuts presenting these alterations. In December, the Inspection Department of Animal Origin Products (DIPOA), linked to

MAPA, released a Circular Letter that defines the classification of myopathies to be observed by the Federal Inspection Service – SIF at the poultry slaughterhouses.

Myopathies, which are physiopathological alterations in the muscles of poultry, don't offer risk to consumer's health, but it reduces the meat quality.

The project team also conducted studies, in partnership with DIPOA/Mapa, UFRGS and IFC, to evaluate the relation between the

presence of visible gastrointestinal contamination on carcasses and the effect on the microbiological contamination with *Salmonella* spp in batches with positive history.

In addition, the concentration of enterobacteria on poultry carcass was evaluated, since they are an indicator for hygienic and sanitary quality during the slaughter process and they reduce the shelf-life of marketed refrigerated poultry meat.

Methodology

Identification of p-NA in meat



Poultry production is susceptible to parasites that require control, as coccidiosis, an infectious disease caused by protozoa of gender *Eimeria*, which are common in poultry handling. Nicarbazin (NCZ) is one of the main products used in poultry feed to prevent the disease. Concerns about the deposition of this additive are frequently discussed, so that a maximum level on poultry meat is stipulated by Mapa. Following what is on the legislation it may not be enough to obtain a safe product for human feeding.

Studies showed that NCZ can degrade into p-nitroaniline (p-NA), a potentially toxic substance for human liver, which control on feed is already recommended by the European Union Commission (UE) since 2010.

So, researchers from Embrapa developed a methodology to help out in the identification of these residues on meat. By means of thermogravimetric analysis coupled to mass spectrometry, it was observed that the decomposition of DNC happens above 250°C forming p-NA. From this result, together with the recommendation from UE to analyze p-NA, a methodology to analyze p-NA on chicken breast (both in natura and after submission to thermal processes simulating domestic meat preparation) was developed by liquid chromatography coupled to mass spectrometry (LC-MS/MS).

Modular Slaughterhouse Equipment attracts interest

An alternative for small companies or producers groups, the modular slaughterhouses were the subject of many meetings in 2019.

Researchers from Embrapa and partners from Engmaq Equipamentos, company from Peritiba-SC that helped to develop the slaughterhouses, attended the demands from entrepreneurs and public authorities interested in the solution offered by the equipments.

As highlight, in March, a researcher from Embrapa presented a lecture about modular and moving slaughterhouses and cold stores at the Legislative Assembly in Sergipe (Alesse), in Aracaju.

At the end of the year, other meetings happened with technicians from Agricultural Defense Agency (Adapar) and Secretary of Agriculture of Parana in Curitiba city.

The first version of the moving slaughterhouse for swine was released in 2015 for productive arrangements organized between enterprises and cooperatives, aiming to offer inspected meat and meat products to local and regional markets.

Genetics Embrapa Market share in 2019



Laying Hen 051

2.860 million
sold birds

14.2% of the national market
of brown-egg laying hens



MS115 Boar

476
sold boars

6.5% of the national market
of terminal males

Technology Transfer

E-LEARNING TRAINING IS IT STRATEGY

Courses are offered at the portal e-Campo

The unit established an important tool for training and technology transfer in 2019 with the release of two e-learning courses – EaD. The first online training offered by the Unit at the site e-Campo, the showcase for online training of Embrapa, was about Agronomic Potential of Swine Manure. From 900 subscribers, 351 concluded the course (39%), which rate is considered normal for e-courses.

The free course had duration of 20 hours, it was divided in five modules, it happened from September 30th to October 24th and it focused on mainly professionals of agronomy, sanitary and environmental engineering or public agents of environmental inspection. The student only got the certificate after answering and being approved in all evaluations.

In December, the Unit released the e-

learning course “Evaluation and classification of swine, carcass and parts of carcass according to IN 79/2018”. The course proposal is to train professional teams to understand the objectives of inspection based on risk and what their role is as professional in this process.

The content base of this

course is result of a research project executed by Embrapa and Inspection Department of Animal Origin Products – DIPOA/Mapa, including specialists from universities. It subsidized the modernization of the procedures of Sanitary Inspection at swine slaughterhouses in Brazil and defined a new regulation.



Partnership

Approaching to the market

An important partnership was established to get even closer the technology and research from Embrapa to the market. A technical cooperation to validate commercial products of Embrapa was set with Korin, a food enterprise based on the philosophy and methods of natural agriculture and it will bring to the consumers two highlighted products of the Unit. One of them is the antibiotics-free country eggs with Embrapa

051 layer genetics. Identified with the Embrapa Technology brand, they must be presented to the consumer in the first months of 2020 in 11 selling points of Korin in São Paulo, Rio de Janeiro and Distrito Federal.

Another partnership includes the special cuts of antibiotics-free swine meat produced in accordance with the In Family Swine Production System, developed by Embrapa, which includes too

the female genetics Embrapa MO25C. The special cuts depend on the final development of Korin label including the Embrapa brand, with expected commercialization in the first semester of 2020. The In Family Swine Production System is an alternative to producers for market diversification, and the guarantee of healthy meat to the consumers, drugs-free and animal welfare production.

Innovation

IDEAS CHALLENGES IN PIG FARMING

InovaPork integrated startups, research and market

Looking for and sponsoring impact innovation for pig farming chain was the challenge proposed by Embrapa Suínos e Aves when promoted InovaPork – Rooting ideas in 2019. The event occurred in 3 rounds. The two first ones happened online, for proposal submission and selection of finalists, and the final one took place at the Unit, in Concórdia-SC.

In the first phase, 46 teams submitted their ideas, which were evaluated by 12 specialists each. There were more than 90 evaluators, both internal and external. The received and selected proposals for the final round of InovaPork were from the states Mato Grosso, Minas Gerais, Paraná, Santa Catarina and São Paulo. Ten groups were selected for the final, when they had the opportunity to interact with mentors, field visitation and to structure their proposals. The

proposed solutions included from environment to handling, welfare and sanity issues.

InovaPork was held by Embrapa, Technology Catarinense Association (Acate), Scientific and Technological Park of Chapecó and the Foundation for Research and Development Support (FAPED). The supporters were Sebrae, Startagro, Darwin Startups, Investors Network Anjo, ACCS, Korin, Swine Academy, Ó Dois Go, Copérdia, Carrusca, Fapesc and Sulita.

The event counted on the golden sponsorship from Seara, MSD Saúde Animal and BRF; silver sponsorship from ABPA, BRDE, Agriness, Biomin, Sindições and SIPS; and bronze sponsorship from Agroceres, ABCS, Icasa, APC of Brasil, Boehringer Ingelheim, Cedisa, Sindicarne, Ourofino, Eurotec and Nucleovet. The ideas challenge also counted on the media partnership Feed&Food, O Presente Rural, Suinocultura Industrial and Suino.com.



Technology Transfer Revenue - 2019

Technology Transfer - US\$ 46,433.69
Foundations of Research Support - US\$ 572,260.69
Contract Copérdia Swine and Poultry - US\$ 322,434.98
Total TT Contracts - US\$ 941,129.36

TT Actions - 2019

Courses 27
Booklets..... 9
Technical Meetings..... 3
Lectures..... 104

InovaAvi 2020 Challenge is in poultry farming

InovaAvi
chocando ideias

Going on the proposal to sponsor impact innovation on the productive chains related to the Unit, Embrapa Suínos e Aves will hold InovaAvi – Hatching Ideas in October 2020. The challenge is now related to poultry farming, both broilers and layers.

With a new format, the finalist teams will be mentored for at least one month and the final round will be during 2 days for immersion at Embrapa Suínos e Aves, besides two days of open event for sponsors/ supporters. InovaAvi will have also an exclusive and dedicated place for working with these teams.

Open Innovation Connection with different sectors

Interaction and synergy are fundamental to complete the innovation cycle. New formats of work, technologies, cases and interaction opportunities with external agents have been presented constantly to the team, who has invested on partners.

InovaPork, one of the actions in this area, connected different players of pig farming. The event allowed the organization of a catalogue of swine farming agtechs and researchers work on the creation of work plans with three of the finalist teams.

The Unit approved a 24 months project to execute actions on innovation, intellectual property and technology transfer, catching financial resources at FAPESC. In addition, the Unit participates in the COMCITI, from Concórdia city, which has expectation to create an Innovation Center.

8

external events

The unit participated of eight external events in 2019, including fairs, expositions and symposiums. Also, it was partner to execute two events of Science and Technology, and it acted in marketing and support of technical focused events and promoted one innovation event.

1,741 mentions in the press

Embrapa Suínos e Aves had 1,741 mentions on newspapers, magazines, blogs, websites and TV stations. This value is 9.8% higher than the registered in 2018.

f 29,696 interactions

Embrapa Suínos e Aves made 281 posts with 29,696 interactions (likes, comments and shares) on its profile on Facebook, as well as publications on YouTube.

2,400 students

About 2,400 students from high school and elementary school were assisted by the Embrapa & Escola program during 2019. The visits are at the Unit or at school. The program consists of lectures and events and it counts on the volunteered participation of employees, including the characters Fritz and Toni.

1,866 calls

The Citizen Customer Service – SAC did 1,866 services in 2019, distributed in consultations by e-mail, telephone, brief and social media.

Communication

EVENT EXPLORES BIOECONOMY

Knowledge and fun at the Science Field Day

Embrapa Suínos e Aves was once again stage for divulgating science to the student public. The fifth edition of Science Field Day received around 1,100 students at 5° and 6° grade from schools of Concórdia and region. The theme of this edition, which followed the Science and Technology National Week – SNCT, was

“Bioeconomy: diversity and richness for sustainable development”. It was presented in different manners through five knowledge stations.

At the station Science at the Laboratories, under Embrapa responsibility, the approach was about the development of a nanostructure for eggs coating,

the Nanovo. The Science at the Poultry Farming, also Embrapa's duty, was focused on the energy production from production wastes, with presentation of BiogásFert.

The Science at the Environment, with three stations,

was coordinated by partners.

One of them was about Agriforest, presented by Lambari Consortium. Another station presented the Natural Resources and sustainability to the students, presented by Jacutinga River Committee, ECOPEF and UnC. CDA Itá talked about Ictiofauna.

The Science Field Day is held by Embrapa with partnership of CDA Itá, Ecopef, Jacutinga River Committee, Unc and Lambari Consortium and support from SINPAF.



People Management

DECADES OF DEDICATION WERE HONORED

Stimulated Dismissal Plan had 22 adhesions

2019 was a year of many changes at Embrapa Suínos e Aves in terms of people management. With the Stimulated Dismissal Plan – PDI, 22 employees adhered and had their work contract finished. The dismissal started in August with the first team containing seven colleagues. In the following month, in September, eight more

colleagues left. In October, it was 3 colleagues, and in November and December, one colleague each month. For 2020, in January and in February happened the dismissal of two more colleagues, one each month. To adhere to PDI, the colleagues should meet some requirements, as having at least 20 years at the company. The

greatest part had 30 years and included positions of assistants, technicians, analysts and researchers.

To honor the colleagues, communication actions were carried out, as the edition of testimonials from the colleagues who left in PDI, special edition of the internal newsletter, certificate delivery and a tribute with the participation of all employees.



August/2019

Carmo Holdefer, Assistant
Diomar Adimar Bender, Assistant
Gustavo Julio M. M. de Lima, Researcher
Leoni Potter, Assistant
Luiz Carlos Ajala, Technician
Valmor dos Santos, Assistant
Valter José Piazzon, Analyst

September/2019

José Bach, Assistant
Márcia Mara Tessmann Zanotto, Technician
Vânia Maria Faccio, Technician
Altir Engelage, Assistant
Lindamar Arienti Gonçalves, Assistant
Eva Solange Schmidt Ribeiro, Technician
Liana Brentano, Researcher
Fátima Regina F. Jaenisch, Researcher

October/2019

Almiro Dahmer, Technician
Gilberto Antonio Voidila, Assistant
João Flávio de Souza, Technician

November/2019

Dianir Maria da Silveira Formiga, Technician

December/2019

Nelson Morés, Researcher

January/2020

Dirceu Zanotto, Researcher

February/2020

Milton Antônio Segnanfredo, Researcher

Mindfulness Continuing practice

The incentive to practice Mindfulness had been one of the main actions on life quality at Embrapa Suínos e Aves. The program started in 2018, by means a presentation to all employees and collaborators and the creation of a volunteered group, which performs the practice once per week at lunch time.

In 2019, the group took part of the course Eight Weeks on Mindfulness, a program based on meditating practices that integrate consciousness on breathing, body and movements, perception of emotional and mental states and psychological approaches to reduce stress and anxiety. The course counted on the support from the Unit's Organizational Climate Committee.

SIPAT Health and life quality

A week full of activities oriented employees and collaborators about health and life quality. That was the proposal of the 43rd Internal Week for Prevention of Accidents at Work – SIPAT. The subjects discussed by mean of lectures were “Anxiety and its first impacts on emotional and physical diseases and at work environment” and “The brain transforms: developing attention on life quality”. Themes as meditation practices and debate about “Challenges for female leadership” also integrated the schedule, and a theater play focused on work safety as well.

2019 Training

70 events

301 participations

4,073 hours of training

US\$ 12,736.37 of investment

Investment US\$ 29,000 in improvements

Priority to the metabolism sector

For one year more, Embrapa Suínos e Aves had to adjust itself to the economic situation of the country. Even so, the Unit was able to invest US\$ 29,129.10 in construction and equipments, a value 36.6% higher than in 2018 (US\$ 21,321.48).

Specifically in construction, the Unit invested US\$ 16.5 thousand. With this value, it was possible to renew the swine experimental nursery. The work will amplify from 32 to 64 experimental stalls, replacing the compacted floor for plastic hollow floor and iron dividers. These adjustments, besides the improvement on stall cleaning, make the place more ventilated, adjusting the facility to the model used in the market.

In addition, the experimental room for poultry metabolism was transferred to another place at the Poultry Experimental Field. When concluded, the new structure will have two rooms for poultry metabolism test and a room for growing chicks, which will support and save time of use of the metabolism rooms. Besides the substantial increment on the capacity to perform tests, the support structure will be improved too, such as the grinding room, cold chamber and locker rooms.

Also, a vehicle Polo MSI 1.6 was acquired in order to renew the Unit's fleet and a disinfection system with two lines of

industrial PVC was installed. The total value of the equipments was US\$ 12,571.96.

Despite the contingency of resources, the Embrapa Suínos e Aves management team worked on the revitalization of experimental facilities, to automate and improve the productivity. A composteur was built by the fence of the Demonstrative Unit and they worked on the transference of the poultry metabolism area.

The room where was located the Research Support Centre was reformed and divided into two, one hosting the Institutional Development and Quality Centre and the other for innovation. By now, the Unit has also a storage place for scrap materials at the sector of Infrastructure Management. The General Archive was transferred to the administrative building by the library, and the former archive place is being adapted to store chemical products.

Also, with the budget delivered at the end of the year, the parking area of the administrative building was expanded, a bulk carrier was reformed, a cold chamber was fixed and a service to unify the deeds of Embrapa's areas was contracted and other demands, such as the acquisition of materials for the Infrastructure Management and feed factory.

2019 STRUCTURE INVESTMENTS

US\$

Reform and adjustment of the swine nursery rooms at metabolism facility	7,792.75
Reform and adjustment of the rooms for poultry metabolism	8,764.39
TOTAL	16,557.14

2019 EQUIPMENTS INVESTMENTS

US\$

Vehicle Polo MSI 1.6	10,878.22
Acquisition of a disinfection system with two lines in industrial PVC (arch)	1,693.74
TOTAL	12,571.96

International

VISITS OF ENTERPRISES AND RESEARCHERS

Partnership prospection is one of the Unit's priorities

The international visits got started in February with the researcher Sumayya Goga from Center for Competition, Regulation and Economic Development (CCRED) of South Africa. The researcher's interest laid on inputs and genetic improvement. The second international researcher at the UD in 2019 was Janet Day, from University of Nottingham, UK. She participated in activities with the team of poultry sanity. In May, the UD received the institutional visit of researchers from University Adolfo Ibáñez and Agricultural Investigations Institute, both from Chile, and from Polytechnic University of Catalunya, Spain, which participated as speakers at Sigera, in Florianópolis-SC.

The performance of the male breeding MS115 was

reason for another international visit in May, but this time Argentinean and Paraguayan mayors, entrepreneurs and producers. It was also discussed the possibility of technical cooperation. In the same month, representatives from the companies Phileo Lesaffre Animal and Impextraco were welcomed to discuss about cooperation projects.

In September, the mayor of the Italian city Sarcedo, Luca Cortese, cordially visited the Unit. Cortese was in Concórdia to discuss about the gemellaggio between the two cities, an agreement that allows the creation of pacts and actions, as well as social, scientific and cultural interchanges. Still in September, the team of socioecconomy and the Assistant Direction of

Technology Transfer welcomed a delegation from the Embassy of the United States in Brazil. Dr. Lindsay Kiberka, head of meat production and commerce estimations at the Department of Agriculture in the United States (USDA), and João Faustino Silva, economist from the Embassy of the United States in Brazil, participated in meetings about world projections for swine meet and socioeconomy studies and production costs.

In December, the professor of Animal Welfare Science from the Royal Veterinary College, at University of London, Troy Gilson, was at UD for experiments about slaughter and euthanasia methods for broilers inside the Euthanasia TED of Mapa.



World

Costs rise in pig farming

The results of the network meeting InterPIG 2019, related to the world costs of swine production in 17 countries, showed that all of them presented costs elevation in Euros, except Mato Grosso and Santa Catarina, in Brazil, and in The Netherlands. The improvement of maize and soybean meal price in Brazil was compensated by the devaluation of Real, the local currency, front to Euro (-19%), but all of them presented elevation in the feed price between 2017 and 2018. The Brazilian competitiveness has still as base, besides the price of the grains in Central-West, its zootechnical efficiency, the labour costs, the installations and equipments. In 2019, the meeting was organized together with the annual meeting of the network Agri Benchmark and the Chinese Academy of Agricultural Sciences in Beijing, China. Brazil is represented by Embrapa since 2008.

Antimicrobials

World meeting in South Korea

Once again, a researcher from Embrapa represented Brazil at the meeting of Codex Alimentarius, the combined program of the United Nations Organizations for Agriculture and Feeding (FAO) and the World Health Organization (OMS), created in 1963 aiming to establish international norms in the aliments field, including standards, guidelines and guides.

The meeting was in Pyeongchang, South Korea, with work teams on reviewing the practices code to minimize and block the antimicrobials resistance from food and elaborating recommendations for monitoring and integrated vigilance of the antimicrobials resistance from food.



SBSA

Partnership of 20 years

During the 20th South Brazil Symposium on Poultry Farming (SBSA) and 11th South Brazil Poultry Fair in April, the Western Core of Veterinarian Doctors and Zootechnicians (Nucleovet) promoted a tribute including 20 companies that were the most frequent partner for the event promotion. Embrapa Suínos e Aves was one of the honored, highlighting the long-term partnership, which includes the participation of researchers in the technical programming and the edition of all annals, headed by the team of editing from the Centre of Organizational Communication.



Award Recognized works

The Unit's genomics team received prizes for works submitted in the XIII Brazilian Symposium on Animal Improvement that happened in Salvador-BA. It was about integrated analysis of transcriptome and exome that revealed new genes related to the scrotal hernia in swine. In addition, the team was also recognized at the Seminary of Teaching, Research and Extension from University of Santa Catarina State, Seminary of Scientific Initiation and Meeting of Graduation from Western Udesc, where new polymorphisms associated to the development of the umbilical hernia in swine authored by researchers, officers and scholars from the research center were presented.

InovaPork Award

INNOVATION IN DISTINCT AREAS

Event was considered the turning point of startups

Three startups got the final award in the first ideas challenge for pig farming, promoted by Embrapa Suínos e Aves in May 2019. The ideas included areas of environment, transportation and genetics.

The award for the winner team was the classification to the final call Bridges to Innovation, as well as the participation in AveSui EuroTier 2019, at the Digital Farming area. The second and third

places also went to call Bridges to Innovation. The three gained also with courses from Swine Academy, trophy and certificate.

The partners and sponsors were also honored with trophy.

The winner proposal came from Chapecó-SC, startup Kemia, which presented about **"Green Technology of electro-flocculation and electro-oxidation for the treatment of residual**

waters".

In 2^o place, the team LebenLog, from Londrina-PR, presented **"Monitoring and traceability in swine transportation from the farm to the slaughterhouse – TransPork"**.

The 3^o place highlighted **"Solution for precision artificial insemination – Agro 4.0"** and was defended by the team B. Tools from Videira-SC.



Scan this code and have more information about the event and the winners.



Recognition

Tribute in the 60 years of ACCS

Embrapa Suínos e Aves was one of the honored ones by Catarinense Association of Swine Producers (ACCS), which completed 60 years of activities in 2019.

The Unit was represented in the ceremonial by its head Janice Zanella. Also, other partners, associated ones, politicians and important leaders of swine farming in Santa

Catarina were also honored.

ACCS was funded in July 24th 1959 by a group of 81 people with the main objective of helping out the genetic improvement of swine farming in Santa Catarina. However, the importance of this role appeared earlier. The first farmers who colonized the areas near Concórdia already farmed swine for self family consumption.



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