ANNUAL REPORT 2017 Emprapa



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PRESENTATION

In order to demonstrate our work and research efforts made in favor of animal productive chains we report our findings annually. In the next pages we describe the main results obtained in 2017 through projects, contracts, activities, initiatives and actions.

Embrapa's team has overcome the scenario of budget reduction by adoption of creativity and by establishing promising partnerships, in a growing approach to agribusiness advancements. It also began to enter into new chains, such as ducks and turkeys, meeting the demands of the sector as well. Everything is always aligned with the vision of the future and the priorities of Embrapa, previously established in vision and prospection documentations.

We made important contributions to the implementation of public policies involving themes such as re-utilization of poultry litter, modernization of the Federal Inspection System, disposal of dead animals and control of wild boar. A better infrastructure in Genetics research was possible by remodeling Suruvi Experimental Station, which will be operational on the earliest months of 2018. This will ensure the maintenance of the Avian Genetic Conservation Center and give new avenues to modern experimental set ups. In addition to research, the year 2017 was marked by the reappointment of the current administrative direction, validating the effort and results of aligned work of the entire institution's employees. Through this report, we would like to emphasize the commitment of Embrapa Swine and Poultry into its role as contributor of swine and poultry production improvements, ensuring that the final product meets the needs and expectations of society.

Janice Reis Ciacci Zanella

Director-General at Embrapa Swine and Poultry



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*US\$ 1 = R\$ 3.30, March 2018 average value



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Swine & Poultry

Research with quality and commitment

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Analysis | 2017 Production Performance



Brazil produced 13.1 million tons of poultry meat in 2017, which was the world's second largest production. Exports reached 4.32 million tons, the largest in the world. Domestic production increased by 1.72% compared to 2016.



Domestic production reached 3.76 million tons of pork in 2017, the fourth largest in the world. Exports were 693 thousand tons, also the fourth largest in the world. Compared to 2016, Brazilian exports fell by 5.4%.



Brazil produced 39.9 billion egg units, 1.8% higher than in 2016, which warranted the seventh largest production in the world last year. Exports were 5,834 thousand tons, 44% less than in 2016. The consumption per capita in the country was 192 units, indicating an increment of 0.80% in comparison to what was consumed in 2016.



The Brazilian production of turkey reached 390 thousand tons (an increment of 6.1% compared to 2016), occupying the third largest in world. The export of turkey meat reached 109 thousand tons, 21% lower than in 2016, but sufficient to keep Brazil in third place in relation to the international market.

Scenario POLITICAL INSTABILITY AFFECTED THE CHAINS

Concerns for 2018 are associated with corn harvesting

The internal political instability faced by the nation in 2017 associated with an economical macro issue occurring also globally continue to affect country's economy. The overall scenario ended up affecting also poultry and swine farming. In 2017, prices of whole chicken fell sharply, around 10%, and the price of pieces of chicken fell close to 4%. These downhill prices may have contributed to the decline of IGP-DI, which requires efforts by companies to keep overall economy in check.

Labor is a very important item in public policy issues that affect the productive chain. The need to reduce labor dependency and associated problems has created a need for newer paradigms inviting automation, robotization and scale-up by the industries. Plants with a slaughtering capacity of less than 200.000 chickens per day have difficulties to achieve economic viability and, in order to avoid high labor costs and liabilities; there is a clear trend towards automation in slaughter, evisceration and cutting lines. This automation will ultimately have repercussion

in jobs offered around municipalities with great dependence on poultry industry; mainly where medium and small-scale plants are still present and contributes significantly to local economy.

In Brazil, both pork production and consumption are lower than chicken and beef meat. The country ranks fourth in the world in the production and exportation of pork. However, the growth rate of both have not shown signs of increase.

The actual concerns are on maize supplies and prices in 2018. One of the most serious grain-related crisis occurred in 2016, due to low crop yields, high exports and high prices in the domestic market. Many producers and industries had losses in their balance sheets. Nonetheless, the excellent harvest that occurred in 2017 brought the prices down to its expected values.

However, with rising production costs, producers anticipate insufficient profitability particularly due a possible decrease in available crop. This may lead to a fall in the 2018 harvest, causing concerns about grain supply and prices.

The expectation of Santa Catarina and Rio Grande do Sul states to enable the transportation of maize from Mato Grosso due to this latter show lower rail transportation costs should not happen in the oncoming decades.

Thus, in order to support the growth of Brazilian animal production and maintain our competitiveness in the corn export market, careful attention must be paid by grain consumers to the acquisition and maintenance of their stocks, avoiding exporting large amounts which would imply the need to further import the grain.

In 2018, the country faces elections for president and it is uncertain what to expect regarding the upcoming government strategies. The historical difficulties as result of excessive bureaucracy, deficiencies in infrastructure, logistics, labor legislation, weight and complexity of taxation, recurrent themes in the national political-economic scandals, are likely to remain as challenges to country's development.

Swine Production costs decreased worldwide

The outcomes from the InterPIG network meeting held in 2017 in Wageningen, Holland, indicated that pork production costs in 17 countries that participate actively in the world trade had their values in euros reduced, except Brazil. The regions with high swine farm activities and leaders in productivity (i.e., Mato Grosso and the Midwest) were surpassed by the United States mostly due to feed prices. Santa Catarina still shows the highest expenses ratios in production when compared to all InterPIG countries. Since 2008, Brazil continues to be represented in the InterPig by Embrapa Swine and Poultry. Detailed information can be found in reports of the meetings that are available on the website of the Poultry and Swine Intelligence Center (embrapa.br/suinos-eaves/cias).



Administrative Management FOCUSING ON IMPORTANT ISSUES

Consolidation of research and management

In 2017, the administrative chief executives of Embrapa Swine and Poultry acted to prioritize actions in support to research. One example is the reactivation and restructuring of the Suruvi Experimental facilities, which will be concluded in the first half of 2018. With the release of the SES to house the Avian Genetic Conservation Center, the Unit will aid in the reduction of potential sanitary risks and will expand the experimental facilities. Also, Embrapa is already preparing to work with cryopreservation techniques to store germplasm in a safer bank

Another infrastructure completed in 2017 was the Laboratory of Biotechnology and Nanotechnology that is going to assist with new researches in animal nutrition. The Labina laboratory, which will start operating in the first months of 2018, will host studies in vitro for characterization of raw materials and biotechnology assets such as enzymes and probiotics. The support to public

policies was greatly carried out by the chief executives whom dealt with issues such as Disposal of Dead Animals, Reutilization of Avian Bed, and the National Boar Plan, the modernization of Official Sanitary Inspection Systems in slaughterhouses and the environmental licensing of swine farms.

The focus is present in documentations based on peer viewed literature from Embrapa's research to subsidize standards, laws and guidelines by the official services. The management also worked on an extensive agenda with the agroindustry to discuss projects, partnerships and the insertion in new chains, such as ducks and turkeys.

Planning Future of Pig Farming

The year 2017 was markedly by the establishment of newer themes for the oncoming years, such as the creation of a Demonstration Unit "Future of Pig Farming". The object of this particular farm is to demonstrate latest tools and advancements made on animal welfare automation. labor training and sustainability. The partnership is being discussed with Ministry of Agriculture (MAPA) and it proposes a transformation of our outdated facilities into a modern structure that can be used as for demonstration and teaching, in order to become a reference for Latin America producers in housing system for breeding swine in collective pens with automated feeding systems.





Total costing in US\$ million



Investment



Employees in December 31



Production Results in different fields

The Unit generated approximately 49 finalist results during the year 2017. The majority focused on Knowledge advancements, followed by Agricultural Practices / Processes and Information Systems or Analysis. Last but not least, business, software, prototypes, agricultural inputs and methodologies.

Software Environmental education in the internet



In order to reinforce the importance of environmental conservation, Embrapa Swine and Poultry launched in 2017 an Environment Game software. Available in the Unit website, the game was made to educate children at schools. It is composed of four mini games, which explores subjects on the environment and biosecurity. It also reveal to society the role and importance of Embrapa in educative programs and show the portfolio of available technologies that the institution has in attempt to increase the sustainability of poultry and swine production. Examples are composting of wastes and animal carcasses, production of bioenergy, and water reuse and management.



Portfolio RESEARCH INCLUDED 59 PROJECTS

Agenda is a response to the demands of the productive chain



Embrapa Swine and Poultry was involved in 2017 in 41 projects under its leadership and participated in 18 projects leaded by other Units. In relation to previous year, the performance in projects lead by the Unit increased by 7.9%, but had a drop of 21.7% in those leaded by partners/ other Units. Regarding to projects, 17 were concluded by the end of the 2017, and encompassed studies involving the environment, production and management, studies of genomics as well as animal nutrition.

One of the concluded projects, named BiogasFert Network started in 2013 and had its beginning as a partnership between Embrapa and Itaipu Binacional. There were many results achieved in the production of biogas, biofertilizers, GHG emissions and territorial intelligence. During the project time frame the involved team taught courses, trained practitioners and publish in peer viewed scientific journals. Despite of its end, the network continues working together and the outcomes of the project continues its application in the TTBiogásFert project.

After a four-year execution period, the project "Risk factors associated with losses in the preslaughtering period of pigs" was concluded in 2017. The initial objective of this research was to identify risk factors associated with the occurrence of condemnation of carcasses in the slaughterhouses. With the involvement of agroindustry partners, it was possible to map risks, describe procedures for animal welfare and educate teams of people responsible for transportation, producers and managers. In the area of nutrition, studies ranged from searching alternative biomasses and raw materials to the evaluation of enzymes and residues in tissues. In genomics, several research were made towards the development of methodologies used for gene sequencing analysis in swine and poultry farming.

Numbers of 2017

The Unit published 31 articles in peer viewed journals with level A , the highest quality possible.
The total number of scientific papers published in indexed journals reached 44.
31 media articles and 115 articles were published in scientific meetings.
The number of edited books reached 9 .
8 chapters were published in technical-scientific books last year.
12 folders/leaflets/booklets and 4 Series Documents were edited by the technical staff.



Ongoing and approved projects in 2016

Projects under Embrapa Swine and Poultry direct coordination	Research Funding
Swine, poultry and caititus in situ conservation	Embrapa MP1
Wild Boar	Embrapa MP2
Tecnology for biogas and fertilizer production on animal manure for carbon slow agriculture	Embrapa MP2
Review and modernization of <i>ante</i> and <i>post mortem</i> inspection applied to pig's slaughterhouse with federal inspection	Embrapa MP2
Development of a new virosomal antigen delivery system and its effectiveness in the local and systemic immune response	Embrapa MP2
Technologies for destination of dead animals	Embrapa MP2
Methods of cell immortalization for the establishment of new cell cultures aplied to the diagnosis and synthesis of reagents for animal pathogens research	Embrapa MP2
Review and modernization of the inspection system applied to avian's slaughterhouse with federal inspection	Embrapa MP2
Evaluation of indicators and strategies for valuing environmental services in watersheds with intensive livestock production	Embrapa MP2
Genetic and antigenic diversity of influenza A viruses and efficacy of diagnostic methods and nanotechnological vaccine for the control of influenza in swine	Embrapa MP2
Swine and poultry genetic modification metodologies improvement platform	Embrapa MP2
Associated factors with losses during the pre-slaughter handling of pigs	Embrapa MP3
Development of a real-time PCR for rapid multidetection of Salmonella and evaluation of the infection dynamics under controlled conditions	Embrapa MP3
Evaluation of recycled broiler litter with reference to the survival and infectivity of pathogens	Embrapa MP3
Improving poultry production in Ethiopia through production system studies, breed characterization and implementation of improved practices	Embrapa MP3
Development of nanostructured coating for table eggs	Embrapa MP3
Development of software for environmental management of swine farms	Embrapa MP3
Deposition of ractopamine residues in tissues of swine fed meat and bone meal containing this additive	Embrapa MP3
Calcium, phosphorus, and vitamin D levels in laying hen diets to improve productivity and reduce pollutant impact on the environment	Embrapa MP3
Nicarbazin residues in chicken meat raised on reused litter	Embrapa MP3
Evaluation of the immunological components of swine fresh and frozen colostrum	Embrapa MP3
Modeling of carbon sequestration and greenhouse gas emissions through the recycling of organic fertilizers in agriculture (Visiting Scientist)	Embrapa MP3
Transference of technology supporting ATER net involved in production, processing and marketing of meat, milk and eggs in ecological based family agriculture	Embrapa MP4
Good management practices in commercial egg production	Embrapa MP4
Technology transfer for production and use of biogas and fertilizers from pig and poultry manure treatment under the ABC Plan	Embrapa MP4
Cooperation, communication and technology transfer for the production of safe pork without the use of antimicrobials	Embrapa MP4
Technological platform for swine breeding programs	BNDES/BRF
Development of new genomic methodologies to analyse data from next generation sequencing	CNPq
Identification of genes and polimorphysms associated with hernias in pigs using the combination of exomic and RNA sequencing	CNPq
Use of microalgae biomass (Prototheca sp moriformis) to feed swine	Bunge/Solazyme
Gene expression and epigenetics on the manifestation of osteochondrosis in swine	CNPq
Proteases effect (ProAct and Poultry Grow) in broiler diets on performance and cutting income	DSM
Research and development of mobile slaughterhouse for swine and ruminants	Engmaq
Water as a sustainability factor in poultry production	Fapesc
Evaluation of different enzymes and dosages on swine performance, nutrient digestibility and bone composition	BASF
Effect of different levels of dietary selenium on quality in in gene expression and fertility in roosters	CNPq
Development of a low-density SNP panel for swine traceability	Fapesc

Effect of a pellet quality improver (Bredol) on nutrient disgestibility and performance of broiler chickens	Akzonobel
Good practices for migration of housing systems from swine to gestation cells for collective bays	Мара
Biotechnological process for swine wastewater treatment	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	CNPq
Thermal insulation assessment for poultry house covers	Multinova
Evaluation of different doses and types of enzymes in performance, nutrient digestibility and bone composition in broilers	BASF
Evaluation of the benefits of using xylanase in nutrient digestibility in pigs	llender
Effect of pelleting temperature and an enzymatic blend on performance of broiler chickens	Novus
Organic acids associated with surfactants in pelleted feed for swine and poultry	Laza
Thermoprocessed cassava fiber as pellet enhancer for laying breeders diet	Fibervita
Prospecting technologies for the production chain of broilers	Fund. Araucária
Support to the poultry and pig production chains to access the drawback system benefit	ABPA
Welfare in laying production	Мара
Projects which had other research center leadership	Research Funding
Identification and use of genes of interest in production systems	Embrapa MP1
Metagenomics applied to characterizing the microbiome associated with livestock animals	Embrapa MP1
Development and application of bioinformatics tools for supporting animal breeding and production systems	Embrapa MP1
Quantitative tools and methods for using genomic information in livestock improvement and production systems	Embrapa MP1
Reproductive biotechnologies for the emerging production systems in Brazil	Embrapa MP1
Development of new technological plataforms in reproductive biotechnologies	Embrapa MP1
Estudos de avaliação de segurança de nanoprodutos	Embrapa MP1
Studies about safety in nanoproduct applications	Embrapa MP1
Institutional collections of microorganisms	Embrapa MP1
Ex situ conservation of animal genetics resourses	Embrapa MP1
Management and digital curatorship of Animal GRIN (Alelo Animal) Database	Embrapa MP1
Technolgical basis for development and agronomic evaluation of organic mineral fertilizers based on agricultural residues in Brazil	Embrapa MP2
Evaluation of risk factors for specific pathogens and ripening time in Brazilian artisanal cheeses to ensure their safety	Embrapa MP2
Modulation of the immune system to control haemoncosis in sheep	Embrapa MP2
Breeding oats, rye, triticale and dual purpose wheat for agricultural systems in southern Brazil	Embrapa MP2
Technological solutions to optimize the use of waste and biomass as source of agricultural inputs in organic production systems	Embrapa MP2
Technological and incremental development of sheep meat products as opportunity of adding value	Embrapa MP2
Development of MALDI-TOF methods for detection and classification of <i>Brucella</i> spp., <i>Mycobacterium</i> spp., <i>Salmonella</i> e <i>Escherichia coli</i> in bovines	Embrapa MP3
Development of lipossomal immunomodulatory nanosystem with active guidance to hepatocytes as a future alternative tool for R. microplus cattle tick control	Embrapa MP3
Technology transfer in iLPF systems in RS and SC states	Embrapa MP4
Development and implementation of strategies for managing the Animal Health Portfolio	Embrapa MP5
: Development of alternative fertilizers to support the agro ecological management of family-based agriculture production systems in Goiás State	Embrapa MP6
Characterization of handmade cheese produced in municipalities within the Green Corridor Mantiqueira - generating income to family farmers and safe food for consumers	Embrapa MP6
Metaproteomics of ignocellulolytic enzymes from ruminal microbiota	CNPq



SA-Suave Sustainable use of resources

The sustainable use of natural resources is a major challenge. We need to increase agricultural productivity without damaging other services that society receives from ecosystems. This is the objective, the "SA-Suave" project. In 2017, actions were taken to carry out socioenviron-mental diagnostics of an experimental microbasin; the completion of physical, chemical and biological monitoring of water in the Fragosos basin; and the survey of the physical and chemical quality of the soils in the basin's surroundings.

Rain Water storage using cisterns

A project completed in May 2017, resulted in the development of a prototype equipment for storing and conditioning rainwater for the production of broilers. The system was tested in partnership with SinoxTec. In another action, in partnership with the Rio Jacutinga and Contiguos Committee, a survey of 250 cisterns was carried out in the region of Alto Uruguai Catarinense, most of them used for animal watering. At the end of the year, researchers and technicians from Embrapa, ACAV, Sindicarne, agro industries, cooperatives, Fatma and ACCS discussed the issue. In December, a new project was approved by Fapesc to extend research and improve our knowledge on the microbiological quality of rainwater stored in cisterns as pre requisite for use in animal production.



Environment ENCOURAGING BIOGAS AND BIOFERTILIZER

Production from swine and poultry wastes



The TTBiogásFert Project, although in its stage of development, was structured to take actions in Rio Grande do Sul. Santa Catarina. Paraná and Mato Grosso. In each of these four states, Technical Reference Units (URTs) are being established to be used as "classrooms" to train technical personnel and producers in swine and poultry management and production. The main idea is to focus on sustainable water management, treatment, use and agronomic disposal of the waste

been installed in the municipalities of Palmitinho, Rondinha and Pinhal. These selected farms will receive periodic visits from Emater-RS personnel together with Embrapa's team to monitor and apply technologies for the rational use of waste in agriculture, as well as the maintenance of quality of water sources of the basin where they are located.

With the same purpose but prioritizing management and operation of biodigestors for biogas production and treatment of waste using Sistrates, the project is also taking place at São Roque farm in Videira-SC, where it has been working as URT.

In all of these URTs the agents trained will help disseminate information and knowledge. The project organize visits and field trips to present results, technologies and innovations to farmers. Thus, the main objective of TTBiogásFert is to disseminate the production and use of biogas and fertilizers from swine and poultry waste through technology transfer and communication actions.

The first URTs have already

Public policy Phosphorus as an environmental indicator

Embrapa, Udesc and the environmental agency of Santa Catarina worked together to implement a new legislation on application of biofertilizer in soils based on phosphorus element (P) as limiting factor. Therefore, the size of the herd licensed in each establishment is proportional to the capacity of the agricultural soils to receive the produced biofertilizer. If soil does not have the capacity to obsorve the amount of biofertilizer produced, then alternatively the farmer needs to treat wastewater and/or have mechanisms to export phosphorus to other locations. Three states are in the process of implementing and adopting this new legislation, which will provide mutual benefits to environmental agencies, producers and society.





Litter reuse **TREATMENT INACTIVES GUMBORO VIRUS**

Research indicates effective procedures in litter management

The reuse of avian litter is important for the economic and environmental sustainability aspects of poultry production. This requires the adoption of efficient procedures for the inactivation and control of undesirable microorganisms that may pose pathogenicity risks. Treatment of litter in the interval between lots is thus fundamental to prevent the spread of diseases.

The reuse of poultry litter in broiler farms is foreseen since there are no cases of episodes of major impact to the poultry stock and of public health

concern. This measure ensures the maintenance of the sanitary status of the national poultry stock

In a study already published, in partnership with the Brazilian Association of Animal Protein - ABPA, Embrapa demonstrated that the flat fermentative treatment is effective in reducing Salmonella Enteritidis and enteric bacteria in the reused litter. This study has been used as a reference by the Official Veterinary Service and poultry farms. In 2017, Embrapa presented new research results highlighting the flat fermentative

treatment is an effective strategy on Gumboro Disease virus, a highly environmentally resistant viral model. The process can be recommended to inactivate residual avian viruses with equivalent resistance characteristics. This result will be the basis to the Official Veterinary Service scientifically audit procedures requiring certification of the poultry compartments, helping in the decision making of treatment routines for the reuse of the litter between lots of chickens and for its safe disposal in cases of sanitary problems.



Mobile App calculates thermal comfort

One of the greatest challenges faced during poultry production is how to offer a barn with the best conditions of thermal comfort. To help producers and technical agents to solve this task, Embrapa has developed Conforcalc, a mobile app for smartphones and tablets that runs using Android operating system. It uses the Globe and Humidity Temperature Index (ITGU), which calculates the combined effects of temperature, humidity, air

velocity and radiation on bird welfare in the aviary and in real time. The software is very user friendly requiring only simple informations such as temperature in Celsius, relative air humidity in % and bird's age. With only these data, Conforcalc calculates and determines if the environment for that poultry batch is hot, cold or in the optimized conditions. The app is free to download through Google Play Store.

To download and install it, simply access the internet and search for the application following the website

instructions.

Laving hens **Trainingand** discussion

In 2017, there was a lot of research activities and news in the field of egg production. One of the highlights was the work made in aviary fencing, published in Embrapa's Technical Communication, which was the target of many training and discussions, especially with practitioners following the scope of the BPP-Eaas project.

Animals well-being has also been at the forefront of discussions and important events have been held, such as the Technical Welfare Days in Egg Production. The objective of these events is to promote partnership with the MAPA, discussing technical advances and animal welfare practices applied in laying hens farming in the country exposing the vision of government, companies and producers. Another research project to be highlighted in 2017 was the Nanovo, which conducted quality tests and defined an important partnership with the companies TNS Nanotecnologia S.A. and Fornari Ltda.

Exportation Technical support for drawback

Through a formal agreement between Embrapa and ABPA, and with the support of the Ministry of Industry, Foreign Trade and Services, Embrapa prepared and maintain tables and worksheets updated supporting Drawback Customs Regime. The material targets the conversion between inputs and end products exported from the pig and poultry sectors (chickens, turkeys and eggs)

The worksheets are based on technical information, incorporating the limits of inputs and its overlapping that can be partially or totally replaced. The mechanism acts as a tool to incentive exports, reducing the costs of producing exportable products, making them more competitive in the international market.





To have access to the *Pasteurella* page on internet, access www.embrapa.br/suinos-e-aves/pasteurella.



Bidding will select company interested in the development of the vaccine

Novelty RESEARCH DEVELOPS V PULMONARY SWINE DIS

It protects herd from pasteurellosis, a disease that condemns ar

A proposal to formulate a vaccine against Pasteurella multocida serotype A (PmA), an important agent of clinical disease and condemnation of pig carcasses in slaughterhouses due to pulmonary lesions, is ready. Now it waits for marketing development, which needs to be done by selecting partners in bidding.

During three years, researchers from Embrapa Swine and Poultry studied the problem of respiratory disease associated with PmA in herds , including isolation and esting several strains of PmA. The research identified strains of pacterathat are potential candidates for vaccine development, testing a prototype vaccine for disease prevention in pigs.

The results, according to this research

promising. Based on the outcomes, an announcement to establish partnership in the codevelopment and commercialization of the product is already awaiting fora contract. The objective of the bidding was to select a specialized company and to make a partnership for the final phase of development and production of this vaccine for veterinary use.

Embrapa studies took into account the importance of PmA in pathological



ACCINE FOR EASES

nimal as meat

conditions of pneumonia and pleuritis/pericarditis in swine, pulmonary diseases that offer considerable damage to the productive chain. "Impacts include costs with medicines, reduction in animal performance, increased mortality at the finishing phase of pigs, and increased condemnation at slaughter, which directly affects the production chain, whether or the farm or in the slaughterhouse.

A study carried out on the economic impact of pleuritic / pericarditis in swine in a large slaughterhouse estimated a loss to the industry in the order of US\$ 2.98/slaughtered pig. Assuming that 50% of these injuries are caused by PmA, the damage to the slaughterhouse would be US\$ 1.49/pig slaughtered. In recent years, severe PmA pneumonia have been observed in the field causing severe losses in several swine farms, especially in the growth and finishing phases This points out the importance of proposing a vaccine that acts directly on the agent. The large diversity of Pm serotypes and strain and the difficulty in understanding the pathogenicity are the main factors limiting the development of commercial vaccines for

Due to the current characteristics of production systems, in which pigs are kept confined in lots with large numbers of animals, in most cases, mixing piglets from different origins in the nursery or finishing phases, makes diseases become relevant for the advancement productivity.

Through experiments, we identified the best protection option

The research was initially based on the identification and collection of samples of pigs with pulmonary disease in herds from the largests swine producing regions: South, Middle West and Southeast as well as control animals from the experimental flock of the Unit, free from the main respiratory pathogens, among them PmA. The samples were isolated and the disease was reproduced at Embrapa's laboratory, following the Ethical Principles of Animal Experimentation. Eight of these samples were tested and some were found to be more aggressive than others. Afterwards, reseraches selected a sample considered very aggressive to serve as a host of a new vaccine. One aspect of the study described the expression of the immune response of pigs induced by PmA infection and determined the prevalence of PmA in vaccinated and unvaccinated swine tonsils.

The research Disease and control

The bacteria P. multocida (Pm) is considered an important microorganism that is part of the microbiota resident in the respiratory tract of the swine. To date, five capsular serotypes (A, B, D, E and F) and 16 somatic serotypes have been identified. Serotype A, subject of studies at Embrapa, is one of the most found in pneumonic lesions in swine.

Pm induces variable clinical condition, depending on the degree of immunity of the animal, the virulence of the strain and the serotype involved. Some animals have more aggressive symptoms causing pathologies such as hemorrhagic pneumonia, pleuritis and pericarditis. Some clinical signs observed in infected animals include difficulty in breathing, abdominal breathing, prostration, poor appetite and high body temperature (41.6 °C). Coughing appears as another relevant sign when this bacteria is associated with enzootic pneumonia or influenza. Mortality in these cases may reach 40%. The disease occurs most frequently in the finishing phase, after 100 days of

Clinical signs and macro and microscopic lesions are most of the time not sufficient for a definitive diagnostic of pulmonary pasteurellosis. The diagnostics needs to be performed considering other aspects such as isolation of the PmA or demonstration of the agent in the recent lesions of pneumonia, pleuritis or pericarditis. The control of respiratory infections caused by PmA includes three main factors: the provision of good environmental and animal handling conditions, the use of antimicrobials and vaccination.

The prototype of the vaccine developed at Embrapa intends to act in the focus of the disease, that is, in the control of the agent.

Embrapa

Dead animals Meetings to discuss the issue

In September, councilors from Concordia and municipalities nearby joined a technical meeting to discuss Technologies for the Destination of Dead Animals. The meeting served to demonstrate the high demands and expectations for detailed information on the topic and for alternative solutions. Also in September. Amauc's mayor and secretaries of agriculture were also at Embrapa to discuss the issue. In October, the debate occurred with a commission of mayors from the region of Alto Uruguai Catarinense and representatives of agro industries. The meeting served to contextualize the problem, explain the project and to listen to concerns raised by agroindustry, which is in search of alternatives for the municipalities. In September we also had the State Environment Agency - Fatma personnel to gather at Embrapa in order to discuss animal's health issues and the licensing aspects of technologies and processes involving the disposal of dead animals in Santa Catarina.



^{TEC-DAM} Workshop in Foz do Iguaçu

In May of 2017, Embrapa held the III TEC-DAM Workshop, which took place in the city of Foz do Iguaçu-PR, as a pre-event of the V Sigera Symposium. The event addressed four themes: biosecurity in the disposal of dead animals; design of traditional and accelerated composting units; composting of whole cattle; and anaerobic biodigestion.

Biosecurity REGULATORY STUDY TO PROTECT HERDS

Proposal for finishers

In 2017 researchers completed an epidemiological survey on farms located in the states of Mato Grosso do Sul, Santa Catarina, Paraná and Rio Grande do Sul. which are regions with high concentration of swine production in Brazil. The objective was to assess biosecurity conditions practiced by the farms also to acquire information. Based on the gathered information. researches elaborated a document with recommendations to guarantee biosafety in pig farms for slaughter. Experts hope that the proposal will serve to subsidy the elaboration

of specific regulations for this type of breeding, whose draft was presented to the Ministry of Agriculture, Livestock and Supply (MAPA).

Embrapa's proposal addressed relevant aspects to finisher farms and subsidized MAPA in the elaboration of official regulations, as well as to support companies and producers to improve the sanitary aspect of their herds. Currently, only pig farms that produce, sell, or distribute animals for breeding or semen collection have official regulations with specific biosecurity criteria. These measures are designed to mitigate the risk of contamination of herds and the spread of diseases. Therefore, knowing the location and conditions of the farms is very important. The survival of microorganisms recognized to disseminate disease depends heavily on environmental conditions, such as light and relative humidity, interaction of animals from different herds, and proximitu and relation of farms located nearby. The work also composes the framework that Embrapa is gathering to define and point out the technological routes for disposal of carcasses.



Removal of dead animals (carcasses) Risk assessment

The work being conducted at Embrapa on the transport and fate of dead animals (carcasses) goes beyond participation in technical meetings; the results are in fact being applied in farms. In addition to definition of best technological approaches and routes for carcasses, researchers also conducted risk assessment analysis as a tool to identify and quantify potential risks of dissemination of important infectious diseases. The analysis encompassed the whole process including risks associated during collection, transportation and fate of carcasses. Publications on the subject will be available in the first months of 2018.



Ante and Post Mortem Inspection MODERNIZATION OF PROCEDURES

Focusing on slaughterhouses under Federal Inspection

Since 2015, Embrapa Swine and Poultry has leading a project on the modernization of ante and post-mortem risk assessment analyses and inspection procedures used in slaughterhouses under Federal Inspection. Partners of this work are the Department of Inspection of Products of Animal Origin (Dipoa / Mapa) and several universities. Last year, the project held training courses to collect lesions of granulomatous lymphadenitis and zoonotic parasitic diseases for 25 inspectors from Minas Gerais, São Paulo, Rio Grande do Sul. Santa Catarina and Paraná. The strategy of the meeting was to establish decision-making on the change of inspection procedure and/ or destination of carcasses.

The second meeting held at Dipoa in April, verified the performance and microbiological standards for the evaluation of swine and bovine slaughter processes, which resulted in the first version of a technical note sent to the prevalence of pathogens in products from slaughter. Two scientific peer viewed articles were submitted to the international Safepork symposium, held for the first time in Brazil. Another publication was also prepared in the Embrapa Documents

Series on the subject of qualitative risk assessment for prioritization of biological hazards to public health in the swine production chain.

In October, a meeting was held in Porto Alegre with the companies that produce pork



under the Federal Inspection Service in RS, Veterinarians and the official agents who carry out sanitary inspections of animals. The review of the applicable legislation has also been completed.

National wild boar plan published

In November, two interministers rules were published in the Official Statements of the Union, which instituted the technical advisory group to monitor the implementation and the evaluation of the National Wild Boar Prevention, Control and Monitoring Plan (Sus scrofa) in Brazil. It was the Wild Boar Plan, which established the objectives and actions plan. Embrapa is part of the team and joined to aid in the elaboration of the Plan through its work with Projeto Javali. The Javali Plan also had the participation of several public entities and civil society.

Among the objectives are the review and elaboration of procedures to control the species; monitor its geographic distribution; to disseminate technical-scientific discoveries; and to raise society's awareness of the potential health risks brought in by the species. Wild boar is an exotic species that causes environmental imbalance and damages to small and medium sized crops, as well as pose a health threat jeopardizing people and animals safety. Without natural predators the animal populations is growing rapidly in the country. The International Union for the Conservation of Nature considers the wild boar one of the 100 worst invasive species in the world.

Residues in meat Research on use of nicarbazin

Embrapa Swine and Poultry is investigating the use of nicarbazin to assess its safety considering the effect of reuse of poultry litter and heat treatments on chicken meat. Nicarbazin is used to prevent coccidiosis, an infectious disease very common in poultry farming and it is highly contagious, spreading rapidly by the contact with feces. The main concern is the presence of residues in meat or edible tissues. The research also addresses whether p-nitroaniline, a result of the synthesis of DNC (a fraction of nicarbazin, liable to be deposited in tissues), which has been designated as a carcinogen by the European Food Safety Authority, can be generated during the preparation of food.

Safe meat Antimicrobial free pigs

A new project being conducted for the production of safe pork without the use of antimicrobials started in the second semester of 2017. It complies with the precepts for the supply of safe and valueadded food. This production system is called "Family grown pigs" because animals are raised together from birth to slaughter, and it has been shown to be an efficient procedure for small and medium producers, agro industries and cooperatives to work in market niches, mainly related to familybased agriculture. The focus is to train technical agents and producers to implement good production practices and to structure a set of technology transfer and communication tools to promote the system and to empower target audiences.



Evaluation Concluded the work with chicken 051



A long-term follow-up of Embrapa's chicken 051 laving hens performance involving many researchers, analysts, technicians and assistants was concluded in 2017. An experiment set up performed in Ouro-SC in 2015 with about 700 birds per batch housed in a floor and picket system showed satisfactory results. Two genetic lines used in the experiments produced a number of eggs above known average. The action is part of a technology transfer project in support to ATER networks that operate in the production, pro-cessing and marketing of meat, milk and eggs for family-based ecological agriculture. There are more than 30 units distributed throughout Brazil in partnership with Embrapa Clima Temperado and Embrapa Cerrados.

MS115 Breeding male undergoes tests

The MS115 is the third generation of "swine light" launched by Embrapa. The breeding male is widely spread due to its performance characteristics and carcass quality, associated with the most accessible price to the producer, especially at the smaller scale. In 2017, several performance evaluations and carcass characteristics were initiated to verify MS115 genetic potential in relation to other genetic breeding males. These tests were conducted in both individual and collective pens as well as in situation resembling commercial conditions. This is an important effort to redirect and to additional information to producers.

Technology Transfer R&D RESULTS TAKEN TO FARMS

TT team focuses on user segmentation

The actions performed by the department of technology transfer and innovation support (TT) of Embrapa Swine and Poultry focuses on the specificities of different types of public. They make efforts to prospect, identify demands and organize R&D depending on public interest and demands. The end result is a dissemination of informations and technologies through the support and Technical Assistance and Rural Extension Networks - ATER in support to innovation. Both strategies are implemented not only in the productive sector, but also in the public policy.

The ATER support strategy aims at training agents for information dissemination, using the installation of Technological Reference Units (URTs) and Demonstration Units (UDs) as tools; the production or organization of technical announcements, booklets, videos, portal, courses, workshops and seminars. The team also works in the search for partnerships, especially with Emater-RS, Empaer-MT and Fatma-SC.

Both, projects granted or those underway, focuses on technology transfer, good practices in commercial posture, antimicrobial-free pig production, organic agriculture, water management in farms and spread of BiogasFert results are examples of TT's effort. As a challenge for 2018 the team was granted with a project on good practices for small-scale poultry farming, the use of distance education tools (EAD) and the approach to new ATER models. such as the "Full Bucket" program.

Innovation in the strategies

One of the greatest role played by TT has been on its support to innovation. The strategy used

aims at supporting innovative companies and by changing public policies. To succesfully achieve this, the use of technological inventory of industrial property assets (IP) is used as tools: this involves the qualification of technologies, products, processes and services (TPPS) involving several systems and methodologies of Embrapa as well as prospecting and contracting of partnerships. The partners institutions involved belongs to several segments, ranging from the production of inputs and equipment, through the production of software, applications and TICs, to production systems and processes, vaccine production and methods of diagnosis and genomics, diagnostic methods and collection network of microorganisms with Cedisa, as well as applied genomics and a platform for genetic improvement in swine and birds.





Training COURSES IN FARMING MANAGEMENT

TT team trained swine farmers and practitioners

Embrapa provides two simple and effective tools to help integrate swine producers to manage their farms: the "Custo Fácil" app for Android-based smartphones and the Simplified Integrated Costing Worksheet app for use in computers. Dozens of producers and technicians were trained in 2017 to work using these app and Excel spreadsheets.

At the beginning of the year, producers of nurseries (those who receive the weaned piglets and raised them until they leave the nursery, about 60 days old) from the integrated BRF system, were trained at the research center in Concordia .

The "Custo Fácil" app can be downloaded for free through Google Play Store. The Simplified Worksheet can also be downloaded for free following the link at embrapa.br/suínos-e-aves/cias.



Technology Transfer Revenue - 2017

Technology Transfer - US\$ 35,464,85 Foundations of Research Support - US\$ 510,308.79 Contract Copérdia Swine and Poultry - US\$ 613,432.37

Total TT Contracts - US\$ 1,159,206.01

TT Actions - 2017

Courses	18
Booklets	12
Technical Meetings	. 6
Lectures	134
Seminars	19

Partnership Together with rural extension

The partnerships with the rural extension agencies are fundamental for the dissemination of the technologies developed by Embrapa.

Embrapa swine and Poultry received the Emater-RS Swine Leader, Dr. Henrique Bartles, to discuss actions involving production costs, waste management, water management for animal watering, online courses, the implementation of technical reference units, and mechanisms of participation in projects such as the Family Swine and Mobile Abattoir. In October, Bartles and the Technical Director Lino Moura presented the priority demands of Emater-RS to Embrapa.

In Mato Grosso, main activities were intense in workshops for taining small swine farmers in Cuiabá. These courses were promoted by the Association of Swine producers of Mato Grosso (Acrismat) and had the partnership of Swine Parliamentary Legislators.

Participants included researchers, analysts and technical agents from Empaer, Indea, Senar, UFMT, and other institutions interested on technical assistance and training in rural areas, as well as swine production leaders in Mato Grosso.

In 2017, seminars, lectures and workshops were held on ecologically based systems for poultry and laying hens and swine breeding and mobile slaughterhouse for producers and extension agents. In this project, Embrapa works with the Santa Catarina Federal Institute - Campus Santa Rosa do Sul and Epagri.

Innovation Embrapa in the event Hoje!

Since 2016, Embrapa participates in the event "Hoje!". This event takes place in Concórdia and is organized to provide lectures on innovation, management, IT and agribusiness. In 2017, Embrapa joined the organization of debates with the agribusiness. Analysts from Embrapa lectured and coordinated panels. Also present in the event we had TNS Soluções and Fornari, involved in several projects with Embrapa.

Agreement A minivan for use in events

In September, Cidasc granted a minivan to Embrapa. This particular vehicle was granted under an assignment term up to 2020 and will be used as showcase in events, technology transfer actions and specific tasks such as field days. The minivan has a computer, refrigerator, television, meeting table and other equipment's of support.



Embrapa Genetics Market share in 2017



12 external events

In 2017 Embrapa was present in four fairs with technical booths. Eight events where organized and supported by Embrapa. In each participation, technologies and services were presented to the public, through showcases, publications, models, videos and presentations.

1,055 mentions in the press

Embrapa Swine and Poultry was mentioned 1,055 times in the press. These include appearances in newspapers, magazines, radio, websites and TV. On average, the institution was cited more than twice a day in the media.



In 2017, Embrapa Swine and Poultry released 243 posts, had 81,021 videos watched and 42,942 interactions with public.

2,045 students

During 2017, about 2,045 students were attended by the Embrapa & Escola program. In total, 44 schools were attended. These visits occurred at the institution or at schools. The program involved lectures and events and counts on the voluntary participation of employees that incorporate and dress up as characters resempling immigrants (the locally well-recognized characters named Fritz and Toni).



The Citizen Assistance Service -SAC made 1,690 assistances in 2017. These included attendance through e-mails, telephone, letters and/ or social

Communication MATH IS AN ATTRACTION IN FIELD DAYS

The theme is explored in research and the environment

In 2017 Embrapa Swine and Poultry held the third edition of Science Field Day, which had an attendance of more than 800 students from 29 elementary schools in Alto Uruguai Catarinense. The objective of the event was to show the science performed at Embrapa and how the outcomes influences society on a daily basis. The event took place with the help of a consortium of institutions including the ambari Consortium, the Rio Jacutinga and Contiguos Committee, the Environmental Center Itá - CDA Hydroelectric Power Plant and the Co -Management Team of the Fritz Plaumann - Ecopef

State Park. The National Syndicate of Agricultural Research and Development Workers - Sinpaf (Local Section) and Gelnex were the main supporters.

The event occurred for over three days and included several activities of team work dynamics, strategies to effectively achieve goals and mathematics. In the Laboratories, people explored techniques of DNA extraction and physico-chemical analysis. Students were also invited to

know how mathematics could be used in

the production of swine and poultry. Lecture on environmental pollution and management were also covered during the event. At the Consortium Lambari Station. mathematics was used to educate people regarding environmental issues associated with production of honey. The CDA Itá addressed environmental biometry, showing techniques for data collection and identification of trees. The Rio Jacutinga and Ecopef Committee managed issues related to garbage handling through story telling activities.

Dia de Campo da Ciência

Affordable information Website gets special webpages

In 2017, Embrapa Swine and Poultry developed other two special webpages on the internet. The Welfare in Swine Industry highlights one of the most controversial topics currently faced by the animal protein industry. The issue involves the entire production chain; from the producer to the technical agents, from the farm to the agribusiness and transportation. All players from the production chain are in the search for better practices and standards in swine handling. It is possible to access information, on the site, in the form of documents, booklets, guides, folders and videos on swine welfare during animal production and breeding, loading and transportation and in slaughterhouse.

Another important issue was porcine pasteurellosis. The website announced and highlighted the need for companies interested in the development and commercialization of vaccine for exclusive veterinary use. In this forum we findnewspapers, publications and photos.

Meat Quality was another important issue in which Embrapa assured special participation. The webpage contains research content showing the contribution of Embrapa in the area of production of poultry, pork and beef.



Employee Management TRAINING FOR RISK MANAGEMENT

Partnership with Syndicate and NGOs to health prevention

Embrapa Swine and Poultry provided intensive training to 20 employees preparing them to execute cardiorespiratory arrest in potential victims. The training was held in November, 2017, and had the objective to enable participants to use defibrillators in patients with cardiac arrest or in the process of heart attacks. The equipment was donated by Sinpaf -Section Concordia in September, at the end of the Internal Week of Prevention of Accidents of Work - Sipat.

The training was conducted by the "Safe Heart Association," an NGO that is working to authorizemembers of society to act in situations where help should be immediate, particularly important in occasions where arrival at Hospitals or emergency are delayed. Physicians Fernando Bernardi and Claudio Peralta Filho, as well as Nurse Caroline Hardt, were responsible as instructors. The volunteered employees who participated in the training came from various departments.





Training Designing Fire Fighters Brigade

Twelve employees completed a training to become Fire Fighters. The course was divided into two modes and took 8 hours of orientation by members of the Voluntary Firefighters of Concordia.

The first mode was on first aid and the second mode on firefighting. Among the responsibilities of the Brigade include prevention actions (knowing the fire emergency plan, assessing existing risks, inspecting firefighting equipment, first aid, inspecting escape routes, reporting irregularities, guiding employees and visitors during the occurrence of accidents or training, participate in the simulation exercises) and emergency (apply the basic procedures established in the fire emergency plan of the plant).



Campaigns Health always in first place

Embrapa Swine and Poultry annually carries out two important health campaigns, with a focus on prevention: Pink October and Blue November. In 2017, women and men attended personal classes. Men, also received guidance and information from health professionals. In addition, topics such as blood pressure, cholesterol control, glaucoma and blood donation were addressed throughout the year with information and guidance to all employees.

Professional qualification in 2017 49 events 362 participations 5,028 hours US\$ 15,313.98 in investment

Quality of life Motivation through lectures

The improvement of the organizational environment within the institution aid quality of life and productivity. In 2017, some important lectures were taught on with the help of partners such as the IFC - Campus Concordia, Unimed and Hospital São Francisco, as well as liberal professionals. The topics covered behavioral issues involving excessive human complaints, anxiety control, friendly relationships and ethics, and healthy lifestyles such as eat well.

Transparency Training at SEI

Embrapa Swine and Poultry joined the Electronic Information System (SEI), which already serves several public agencies to reduce expenses and maintain transparency in the documentation and processes. SEI has trained 131 employees through online courses (ENAD) and other 78 in classrooms.

Embrapa

Investments US\$ 557,173 IN INFRASTRUCTURE

Remodeling the feed mill is a priority

Despite the fact that 2017 was another year in which Embrapa Swine and Poultry had to adapt to budget cuts faced by country's economic restrictions, the institution was still able to invest US\$ 557,173.01 in the infrastructure and equipments. The total amount invested was comparatively superior (32%) than 2016.

In 2017, the priority was the refurbishment of the feed mill installed in the institution. Built in 1980, the facility meets the demands of Embrapa's providing feed to many experiments and in the maintenance of swine and poultry farms. The feed is produced in the form of pellet and mill. The plant has an area of 1,225 m² and produces 2 thousand tons of feed annually.

For the infrastructure reform, US\$ 247.7 thousand were invested last year to comply with the Normative Instruction of MAPA, and to improve the structure for providing training courses. Among the main equipment acquired for the feed mill are a pelletizing press, a set of equipment for weighing and mixing inputs, a grain grinder and a horizontal type feed mixer with a capacity of 500 kg per beat, besides other items, totaling US\$ 141,125.38.

A total of US\$ 90 thousand were invested in the reform of Suruvi Experimental Station, The area of 34.5 hectares will receive the Avian Genetic Conservation Nucleus. The Biotechnology and Nanotechnology Laboratories also received investiments are currently being built.

INFRASTRUCTURE - 2017	US\$
Feed mill reform and expansion	247,727.27
Addendum for the conclusion of Suruvi Experimental Station	90,455.00
TOTAL	338,182.27
	marR\$ 695.200,00
EQUIPMENTS - 2017	US\$
Pelleting press	53,030.30
Isolated air basket	24,693.94
Set of equipment's for weighing and mixing of feed ingredients	23,620.91
Hybrid Phone System (TDM + IP) and peripherals	15,313.03
Spectrophotometer	14,955.45
Cereal grinder, without motor, with magnetic plate, loose hammers, direct coupling in the motor	13,130.30
Density Seed Table	10,909.09
500 kg capacity horizontal mixer for feed	10,706.06
Set of helical threads	10,301.65
Others	42,330.01
TOTAL	218,990.74

TAÇÃO DA FÁBRICA DE RAÇÕES RAPA SUÍNOS E AVES

Executor: Construtora Foscarini Eireli Inicio da Obra: 22/01/2018 Término da Obra: 20/08/2018

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International VISITS OF COMPANIES AND PRODUCERS

Search for partnerships is on top priorities

Embrapa has a policy that dictates and encourages international cooperation for studies, events and partnerships.

In May of 2017, the department of Poultry Health organized a seminar entitled "Successful Diseases Monitoring Strategies and Tactics: Outbreaks Prevention and Management" by Jeff Strain of Thermo Scientific. APC - An LGI Company, by director Joy Campbell and by the company's manager in Brazil, Luís Rangel. APC investigates the benefits of using plasma proteins produced by spray drying on animal diets. The objective of the meeting was to to foment international cooperation between institutions and discuss the future of plasma in swine and poultry farming.

Vetanco's biotechnology director at Sherry Layton and the veterinarian Emanuel Gumina were welcomed by researchers to conduct activities in the laboratory to test vaccines against salmonella in pigs involving.

Embrapa also received two commissions from South American producers. The first held in August was from a committee from Colombia (the National Poultry Federation of Colombia - Fenavi). The group of poultry and egg producers talked about water management in broiler and laying production, the control of flies and treatment of dead birds.

In november we held the other commission this time from Chilean Representatives of Agrícola Super, the National Association of Pork Producers and the Chilean Agricultural and Livestock Service, who presented the situation of agriculture in their country. The Chileans also attended a meeting with Embrapa's researchers on animal health.

Also in September and December there were two other visits from representatives of Agriculture Livestock Industries Corp. (Alic) of the Ministry of Agriculture of Japan. They were in Brazil to survey the brazilian marketing on the production of chicken and pork meat.

We also received students from Ohio State University (USA) who learned about the activities being conducted at Embrapa.

The institution was also present in numerous international events such as conferences, symposiums meetings and workshops. Examples include meetings with the OFFLU technical group of the World Organization for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO) which took place in Rome, Italy, in march.

Sigera Symposium is in its fifth edition

Embrapa Swine and Poultry participated in the organization of the fifth edition of SIGERA (Symposium on Agricultural and Agroindustrial Waste Management - Sigera) in Foz do Iguaçu-PR. The event brought together experts from all over the world to discuss issues related to waste treatment, addressing remediation technologies; production and use of biofertilizers; impacts on water-soil-air and plant systems; energy generation and waste management systems.

Sigera offered courses, thematic panels, lectures, platform presentations of scientific works and a visit to CIBiogás. Also the 3rd TEC-DAM workshop was held in the same event.

NAI Research with the United States

In 2017, besides all attempts made to approach international companies and institutions through technical visits, the International Articulation Center -NAI also worked closely with researches from Rice University and USDA, which resulted in the submission of a research proposal for a public notice issued by this department. The NAI also provided support for an international contract signed with Evonik, a German nutrition company.

Netherlands Doctoral thesis defended

The Researcher Franco Martins defended his PhD thesis in September. The title was conceded by Wageningen University & Research in Netherlands. The title of the thesis was "Diversity of coordination mechanisms to support transactions - Farmer-buyer relationships and farmer performance in the Brazilian pork chain".

SafePork Safe meat production

In 2017, Embrapa assisted to held one of the most prestigious international events known that addresses safe pork production, the SafePork. In its 12th edition, the meeting was held for the first time in Brazil (Foz do Iguaçu-PR) and gathered experts from all over the world to discuss themes involving safety of pork products in an integrated perspective within the concept of farm to table. For four days, technicians working in the pig production and pork industry, regulatory, defense and inspection bodies, as well as many experts in the field discussed

the topics. The dynamics of the event included lectures, forums, workshop and presentation of scientific papers.

SafePork 2017 was organized by the Brazilian Swine Veterinary Society - Abraves National, by Embrapa and by the Federal University of Rio Grande do Sul. The event was previously held in the United States, Denmark, Germany, Greece, Italy, Canada, the Netherlands and Portugal.





Innovation Mobile slaughterhouse was awarded





Embrapa Swine and Poultry won the 7th edition of the Stemmer Innovation Award in the category of Innovative Institution. Embrapa entered the contest with our truck slaughterhouse, a traveling unit equipped for slaughtering animals and available in three models: swine and ruminants, poultry and fish. The technology was developed in partnership with Engmag, of Peritiba-SC, and with support of Fapesc and Cidasc. The technology is an example of success for open innovation between Embrapa and private partnerships. The award ceremony took place in November at the Federation of Industries of the State of Santa Catarina (Fiesc), in Florianópolis.

The mobile slaughterhouse for pigs is currently being tested at the IFC Campus Concordia and undergoes validation at the Ministry of Agriculture, Livestock and Supply - MAPA. The technology will allow changes in the public policies and benefit small producers.

A modular mobile slaughterhouse for goats and sheep was sold to a company in Minas Gerais. Embrapa and Engmaq are also working on a mobile pork loading platform, and is currently under preliminary testing.

Recognition RESEARCH TEAMS RECEIVE AWARDS

Unit was contemplated for event support

Embrapa Swine and Poultry research teams received ten awards in 2017. In May, four researchers were awarded at the Facta Conference with the José Maria Lamas da Silva Prize, held in Campinas, SP, in the areas of health, nutrition and "other areas", with Daiane Voss-Rech. lara Trevisol. Liana Brentano, Virginia Santiago, Raquel Rebelatto, Fátima Jaenisch, Arlei Coldebella, Clarissa Vaz, Fernando Tavernari, Diego Surek, Jonas dos Santos Filho, Gerson Scheuermann, Dirceu Talamini and Teresinha Marisa Bertol. besides an honorable mention for the researchers Gerson

Scheuermann, Arlei Coldebella, Paulo Sérgio Rosa and Luizinho Caron.

In July, Embrapa Swine and Poultry was recognized from Cedisa during the celebration of the 28th anniversary of the diagnostic center. The researchers Jonas dos Santos Filho and Teresinha Marisa Bertol received an honorable mention at the International Salon of Poultry and Swine Industry (Siavs) in São Paulo, SP, in the category of oral presentation. Another tribute took place at the South Brazilian Swine Symposium in Chapecó-SC, for the

tenth year of partnership in the event. Recognition also received at the Brazilian Congress of Biometeorology, Ambience, Behavior and Animal Welfare, held in Jaboticabal-SP, for Osmar Dalla Costa, Arlei Coldebella and Antonio Guidoni.

In October, Dr. Jalusa Deon Kich and her research team ranked first in the health category at the Abraves Conference in Goiânia-GO.

At XI Jinc, in Concordia, a paper with the participation of Adriana Ibelli, Jane Peixoto and Monica Ledur won in the

category of biological sciences and engineering.

Claudia Magazine Award Director in the finals

Janice Zanella, main Director at Embrapa Swine and Poultry, was one of the finalists of the Cláudia Magazine Prize, competing in the category of Sciences alongside with the virologist Marilda Siqueira and the astrophysicist Elisabete Dal Pino who was the finalist. Janice was noted for her nearly 30 years of work in pursuit of technologies that ensure the safety of poultry and swine production and her work in managing the research center in Concordia. The award ceremony took place in October in Sala São Paulo, in the city of São Paulo. In 2017, the prize promoted by Abril's Claudia Magazine, completed 22 editions with the objective of "discovering, highlighting and valuing competent, talented, innovative women committed to making a better Brazil".





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Bibliographic Normalization

Cláudia A. Arrieche

Translation Gustavo J. M. M. de Lima

Review

Márcio Busi

1^a edition 1^a print (2018): 200 copies

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Cataloging in Publication (CIP) Embrapa Swine and Poultry

Embrapa Swine and Poultry.

Annual Report 2017 / Editors Monalisa Leal Pereira, Lucas Scherer Cardoso. -Concórdia: Embrapa Swine and Poultry, 2018.

22 p.: il. ; 27 cm. (Documentos / Embrapa Suínos e Aves, ISSN 0101-6245; 192).

1. Agricultural Research. 2.Embrapa Swine and Poultry. 3. Report. I. Pereira, Monalisa Leal. II. Cardoso, Lucas Scherer. III. Title. IV. Series.

CDD 630.72

[®] Embrapa 2018



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Documentos 192

ISSN 0101-6245



